ANNUAL REPORT

DEPARTMENT OF
CIVIL, CONSTRUCTION
AND ENVIRONMENTAL ENGINEERING

March 2005

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NANCY QVALE

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HIGHLIGHTS FOR 2004

Every faculty and staff person in our department is committed to making life better for the people we serve. Some of the evidence that proves that the faculty, staff, and students of CCEE continue to strive for excellence is summarized below. The complete report provides more detail.

Our People--Our highest priority

- Changes
  - A new faculty member
  - A new research faculty member (clinician)
  - A new research associate
  - A new secretary
- Achievements
  - James M. Hoover Chair
  - Gerald and Audrey Olson Professorship
  - 12 faculty in national leadership positions
  - 7 faculty with national awards, 10 ISU awards
  - 32 international country visits
  - 4 national graduate student awards

- Several regional and national competition successes by our student chapters (design build, heavy highway, concrete canoe, steel bridge, commercial buildings)
- Marston Metal Alumni award

Our Research and Graduate Programs

- A 3 percent increase in our research expenditures with increases of more than 50% for nine faculty
- A stronger and promising relationship with our research partner—the Center for Transportation Research and Education
  - Portland Concrete Cement Center
  - Bridge Engineering Center
  - Iowa Traffic Safety Data Service
  - Partners for Geotechnical Advancement
- A 41 percent increase in total dollar value of funded proposals (up to $15,400,000)
- About constant graduate enrollments, but major increases in Ph.D. students to 40 percent

Our Undergraduate Programs

- Significant improvement in advising (e.g., individual undergraduate programs of study, website, FAQ)
- A construction engineering learning community
- Updated Planning and Assessment report for continuous improvement
- Students to Mexico, Australia, New Zealand, and Singapore
- The beginnings of an articulation agreement with Lanzhou Jiaotong University, China
- Continued evolution of our curricula, particularly in the area of communication and business skills
- A capstone course sequence (CE 485 and 486)
- A 94% passing rate on the Fundamental of Engineering Exam by our students
- Very active student chapters—on campus, in the community, and around the nation—social events, field trips, national conferences, student recruitment, speaker programs, service projects
- A 3 percent increase in enrollments with an increase in the percentage of females
- 4.6 B.S./FTE, almost twice the average of the Top 20

Our Advisory Councils

- A joint CE ISU/UI meeting for brainstorming collaborative activities
- A ConE strategic plan

Our Facilities

- Dedication of the Livesay Structural Materials Testing Facility
- Remodeled graduate student office space with a need for more
- Plasma television in the lobby
- New student computers and associated hardware/software
- Upgrade of high speed internet to T100 base

Our Development Activities

- Alumni receptions in Kansas City, Twin Cities, Washington, D.C., Baltimore, Denver, and Ames
- Golf tournament in Arkansas
- New funds for faculty, students, and facilities
- Koch Graduate Fellowship for Ph.D. students and other research fellowship funding
- Three large gifts/pledges at beginning of FY05

Our Challenges for Next Year

- "Passing the torch"—a new department chair

1.0 INTRODUCTION

The 2004 annual report for the Department of Civil, Construction and Environmental Engineering follows. Faculty, staff, and student achievements are summarized first, including awards. Brief summaries of committee activities and the student professional chapters are given. Comparisons to our peers, diversity, development efforts, safety, facilities, and recruitment and retention activities are presented as departmental information. Three separate chapters outline departmental progress in teaching (including curriculum developments), research, and outreach. Several appendices present lists, numerical data, and charts that summarize our faculty, staff, and student achievements; our productivity in teaching, research, and outreach; and comparisons with our peers.

2.0 FACULTY, STAFF AND STUDENT INFORMATION

The departmental organizational chart and a complete listing of faculty and staff are in Appendix A. Professional registration, educational background, engineering experience, and international experience are included.

2.1 Faculty Achievements

One new regular faculty member and a research faculty member (clinician) joined our staff in Fall 2005.

Dr. Chris Rehmann left a faculty position at the University of Illinois to join Iowa State in Dr. Rehmann received his B.S. from MIT and his Ph.D. from Stanford University. His research expertise is in the area of mixing and transport in fluids using advanced measurement techniques, large scale ocean circulation, mixing produced by air bubble plumes and zebra mussels. Chris will be teaching and conducting research in the environmental engineering area.

Dr. Samir Khanal joined CCEE and the Center for Sustainable Environmental Technologies as a post doctoral research associate in 2002 and moved to a research assistant professor position (clinician) in 2004. He received his Ph.D. from The Hong Kong University of Science and Technology in 2002. He leads and is a member of teams conducting research on fungal projects, biodegradation of steroid hormones, anaerobic digestion, and other waste treatment technologies. Several graduate students work under his direction.

John Pitt retired this past year and James Bolluyt started phased retirement.

In recognition of their achievements in the professional area, in research, and in teaching, several faculty members have received awards conferred by peers, both nationally and locally, and by their students (see Appendix A).

Of our faculty members, 89 percent have at least one year of engineering experience, 34 percent have at least three months of international engineering experience, and 77 percent are registered engineers in Iowa or other states.

2.2 Staff Achievements

Brent Francois joined CCEE as a research associate in the water quality area. He received his B.S. degree in Animal Ecology—Fisheries Management in 2003 from Iowa State. He will be working with Donna Lutz on the Des Moines River Water Quality Network.

Denise Wagner joined CTRE and CCEE as the PCC Secretary. She coordinates many of the activities and laboratories of the Portland Cement Concrete Center at CTRE. She has been a secretary with the Department of Physics and Astronomy, the Off Campus & Adult Student Services, and the Admissions Office.

The staff in the Civil, Construction and Environmental Engineering Department, including

professional and scientific employees and merit employees provides an essential support role to our success. Their dedication to excellent work and their loyalty to the department are very apparent. P&S and merit employees who were recognized by awards this past year are listed in Appendix A.

2.3 Student Achievements

Again this year, our students achieved an excellent passing rate in the Fundamentals of Engineering exam of 94 percent, compared to the national rate of about 76 percent.

Civil engineering and construction engineering students have also been recognized locally and nationally for their early contributions to the engineering profession by special awards. Chapter 3 summarizes some of the activities of the student chapters. See Appendix A for lists of awards and scholarships.

2.4 Alumni Achievements

We are very proud of the achievements of our alumni. See Appendix A for a list of alumni awards.

3.0 DEPARTMENTAL INFORMATION

3.1 Committees

Our Town

The OUR TOWN campaign activity continued to grow during the 2003-04 academic year. With the help of the ISU Foundation staff in the College of Engineering, members of the group visited with several alumni to listen to their interests and to present specific proposals. Members of the group also hosted alumni receptions in several cities: Kansas City, Twin Cities, Denver, Washington, D.C., Baltimore, and Des Moines. During the day before the evening receptions, we schedule face-to-face visits with individuals in each of these cities.

The fund raising aspect of the campaign has been successful and we fully expect it to continue. The basic approach is simple—stay in touch with our alumni and inform them about the great things that are going on in CCEE! Our excellent CCEE Website and Newsletter will continue to be another way of staying in touch with all alumni. We are developing specific proposals for potential individual givers, including named laboratories. Major gifts were received to fund faculty chairs and professors, graduate fellowships, and remodeled laboratories in the Town Engineering Building. A status update follows:

- The Julia B. and Wallace W. Sanders Structural Engineering Laboratory (tie down floor being designed)
- Livesay Structural Materials Testing Facility (equipment acquired and dedication conducted)
- James M. Hoover Chair (established and awarded to Vern Schaefer)
- Gerald and Audrey Olson Professorship (established and awarded to Reginald Souleyrette)
- Bruce C. Koch Graduate Fellowship for Ph.D. students (established)

Our gift receipts were down for FY 05 but three large gifts/pledges (Hoover Chair, Olson Professorship, Koch Fellowship) were made in the summer of 2004 that are not included in this report. Additional fundraising efforts will continue for:

- Environmental engineering professorship
- Transportation engineering chair
- Geotechnical/construction engineering chair
- Integrated curriculum chair
- Graduate student support in all areas
- Equipment for the structures, environmental, and geotechnical laboratories
- Outdoor structures testing facility
- State-of-the-art classroom for transportation design teams
- More study space for undergraduate students
- CTRE addition to Town
- Construction engineering chair
- Leadership Institute for CCEE

Health and Safety Committee

The major occupational health issue in Town Engineering Building was effectively dealt with in 2003 with the extension of the laboratory hood exhausts to above the highest occupied level of the building. While the possibility of reintrainment of nuisance odors from plumbing vents still remains a possibility, administrative controls regarding the disposal of manure and other odoriferous wastes minimized odor complaints in 2004.

Because of an injury to a student employee in another department, Environmental Health and Safety (EH&S) put an emphasis on shop safety in 2004. Jim Gaunt distributed EH&S's brochure, entitled "Shop Safety Audit," to laboratory managers and others who have responsibility for areas where machine tools and similar equipment are used. An important objective of this effort is to assure that supervisors train all employees, including students, to safely operate the equipment in these areas.

Women and Minorities Committee

In the fall 2004, the Women and Minorities Committee met and decided to hold a social event to bring in women and minority students for the CCEE department together. In 2004, the committee did not receive any complaints about incidents of discrimination, harassment, or unfairness of any kind.

Alumni and Public Relations Committee

The Alumni and Public Relations Committee of CCEE has met several times during the year to determine potential nominees for various college and university alumni awards. The committee has submitted, or is in the process of submitting, several names for awards such as the Marston Medal, PACE, PPEA, and Young Alumnus. This past year successful nominations who were selected as award recipients are listed in Appendix A.

Faculty and student input were collected for the two Alumni Newsletters that were published this year. The fall 2004 edition's format was revised to reflect the look of our website and additional space for stories was provided on our web site with links from the hard copy edition.

Advising and Student Concerns Committee

For the 2004 calendar year, the CE Academic Advisor began work on developing a CE Faculty Advisor's guide. The guide will be web-based containing essential information on advising duties and responsibilities with links to the University Advisor's guide and other important ISU support offices. Included in the Advisor's guide will be a check list, updated academic course flow charts, advising forms and a list of Frequently Asked Questions (FAQ). As of Dec. 2004, the Advisor Guide is still being developed.

The Fall 2004 barbeque organized by the CE Academic office was very well attended. ASCE and AGC displayed their current activities (such as steel bridge) and each division provided information on their current research programs. The committee will coordinate with other committees and students' organizations in fostering opportunities for the undergraduate CE students to meet, socialize, and informally talk with the CE faculty and staff outside a formal office and classroom setting. Activities include: improving interactions during the regular Fall CE barbeque, CE softball game at the end of each spring semester (organized by ASCE), and organizing CE luncheons in the Spring semester.

A 2-hour advisor's workshop was held on Oct. 14, 2004 to discuss changes and updates in the curriculum and the CE Student Guide(s), and the development of the Advisor's guide. Julia Apple-Smith of the COE International Programs was invited to discuss academic issues related to the Study Abroad program.

CE students continue to use the Educational Objective (EO) and program-of-study (POS) as part of the student advising process. The EO and POS are introduced to freshmen in ENGR 101 by the CE Academic Advisor. Each CE student is then expected to complete the POS for the student's entire undergraduate degree program in CE 104. The POS is reviewed every semester by the Faculty advisor and updated. Development of an interactive, computer-based POS system by a consulting company appointed by the College of Engineering is delayed. The original implementation was for Spring 2005 registration. The CE paper-based POS system will be replaced once the College-sponsored POS system becomes available.

Since the current composition of the committee does not reflect the requirements of the Governance Document, the committee worked on amending the Governance Document to correctly reflect the committee and its activities.

Faculty Council

The Civil Construction and Environmental Engineering Faculty Council (CCEEFC) accomplished several tasks as called for in the department's governance document. This past year the CCEEFC reviewed all the annual reports submitted by the entire faculty and forwarded ratings and evaluations to the Department Chair.

A considerable amount of time this year was spent in evaluating and presenting cases for tenure and/or promotion. This year five individual cases were forwarded with an approval recommendation for promotion and/or tenure. These cases were also presented to the eligible department faculty for a vote and this vote was also favorable for all cases.

Two additional cases were reviewed and forwarded with an approval recommendation for advancement from the position of Lecturer to that of Senior Lecturer. The CCEEFC also reviewed cases where the non-renew dates were pending and forwarded recommendations to the department chair.

The CCEEFC solicited names and recommendations for potential individuals who would be candidates for a search committee for the new department chair. The CCEEFC forwarded to the Dean a recommended list of several individuals for this search committee.

The CCEEFC has undertaken a large task this year of updating the department's governance document. A revised draft has been forwarded to all CCEE faculty. The majority of the changes deal with various promotion and tenure issues. Many changes include the department name change, chair's title, committee responsibilities, and others. A vote is anticipated in spring 2005. The CCEEFC also spent considerable effort in identifying faculty who may be eligible and deserving of awards. An individual and a nominator were selected for most of the engineering college and university faculty awards.

Extension Committee

Outreach activities are carried on through a coordinated effort by staff in the CCEE Department, CTRE and the Office of Continuing Education. Staff meetings were held throughout the school year to share needs and solutions to activities being planned for engineers and technicians.

The administration of outreach activities by the University and College of Engineering continues to change to adjust to budget cuts. Work continued on the CCEE side of this work to increase fees to offset decreases in salary support from the state and University Extension. Most clients have responded well with continued support of the activities in this area toward retention of engineering licenses. The Society of Land Surveyors of Iowa was an exception and chose to move their extension support to the Consulting Engineers Council of Iowa for support. The move came primarily as a result of the increase in costs for ISU administration of the two conferences. They still rent rooms from the Scheman Center and the Office of Continuing Education, but do not use the CCEE administrative services.

CCEE and CTRE staff continue to direct much of their work toward the educational needs of the engineers and technicians involved in the public and private sectors of Civil Engineering in and around Iowa. Work has expanded in the Construction Engineering area with support from Master Builders in the areas of workforce development and the EPA in the area of spill control and storm water management.

We have the ability to deliver the education in multiple ways. These delivery methods include the use of the face to face, ICN, distance learning, on site delivery, workshops, conferences and correspondence courses. Programming for technical or general topics is planned as identified by the clients or staff. Continuous improvement in program administration and subject material is achieved through client and participant evaluations of existing programs. CCEE continuing education programming includes the involvement of technical committees and client groups in the planning of future efforts.

The extension efforts continue to be a connection between the students and department in securing scholarship funding, coop and intern jobs, permanent positions and alumni support for the department improvements in the laboratories.

Space and Equipment Committee

A request was sent out to the five division leaders asking for input concerning their needs for space within the CCEE department. There is a continuing need for additional faculty office space for post docs, visiting professors and new faculty. Currently demands are being met with the sharing of some office space. The Transportation division is looking for a classroom facility of approximately 24’ x 38’ for the new Design lab. They are currently compiling funds to outfit the space and are also having the Highway Design Council looking into funding. The Structures division is in the design phase for retrofitting room 130 with a tie-down floor. Preliminary designs have been presented and final funding and designs are being discussed. Inquiries are also continuing for funding the development of a large outdoor testing facility. The PCC Center along with the PGA group and the Geotechnical division is looking for additional space for storage of bulk aggregates, cements, asphalt and additives for research projects.

This past year has seen room 136 remodeled for up to 20 graduate students. Rooms 137 and 139 were remodeled for occupation by the PCC Center staff. Also, work is currently being done on mechanical upgrades to the building elevators. Some work has been done out at the Spangler Laboratory in terms of organizing and cleaning of that space. The Livesay Materials Testing Facility located within room 164 was dedicated. Fire doors were installed on all floors adjacent to the elevator lobbies. Upgrading of the telecommunications system in Town Engineering was completed. Nancy Qvale has continued to provide great service in the scheduling and assignment of classroom spaces.

CCEE International Programs

The CCE International Programs Committee has been working on establishing exchange programs with other universities.

University of Edinburgh: Presently, the CCEE department has an active exchange program with the University of Edinburgh. Dr. Lohnes and Dr. Wipf are the current program champions for the University of Edinburgh exchange. Since 1998, we have had six ISU students attend the University of Edinburgh and five other their students attend ISU.

Monterrey Tech: Drs. Jaselskis and Jahren worked with Professor Augusto Canales, a visiting professor from Monterrey Tech (ITESM) attain his Ph.D. and also establish a partnership for exchanging undergraduate and graduate students. Dr. Jaselskis was a visiting faculty at Monterrey Tech for one week during the spring 2004 semester to further promote this collaboration.

Australia and New Zealand: Dr van Leeuwen has been quite active here in establishing international exchange programs and in helping students study abroad. He is the Coordinator, Exchange Programs in Australia for the College of Engineering at Iowa State University and has visited Australia twice in recent years to negotiate on this and to expand collaboration. The experience gained prior to ISU has been important to build the necessary contacts and experience with exchange programs. He focuses on the University of Newcastle and Tasmania, but also participates in the programs with the Universities of Sydney, New South Wales and Queensland. The Newcastle program has grown tremendously and 21 students from the College of Engineering went there in 2004. The new program at the University of Tasmania has also grown rapidly since it was introduced in 2003. Dr van Leeuwen has initiated a new exchange program with the University of Auckland in New Zealand and visited this university twice to initiate this. He has introduced Dr. Sri Sritharan to be the new coordinator for this program. The intention is to make this program a reduced fee-paying program like the arrangements with Newcastle and Tasmania, rather than a direct exchange program. This makes it easier for our students as we are not able to attract as many of their students as we have wanting to go there.

National University of Singapore and Nanyang Technological University: Dr. Say Kee Ong is also assisting with the National University of Singapore (NUS) exchange program where one NUS student came to ISU during 2004. Dr. Ong is also establishing research ties with Nanyang Technological University.

Lanzhou University: Dr. Kejin Wang is helping to establish an undergraduate program with Lanzhou University in China. The goal is to develop a joint 2+2 bachelor degree program beginning in Fall 2006. In the Fall 2004, Dr. Liang Bo from Lanzhou Jiaotong University (LZJTU) visited ISU to facilitate the pre-program preparations and to ensure a successful program starting in Fall 2006. During his visit, Dr. Bo attended CE 203 and CE 204 classes, learning the philosophy behind the classes and the content. He has also been involved in several

CCEE committee activities, especially in the CCEE/ISU Curriculum Committee meetings. More detailed work on some curriculum issues is still being resolved.

Computer Committee
Computer related purchases are listed in Appendix C.

Special Events Committee (no report)

Other Committees
Note that committee reports related to the CE and ConE undergraduate curricula are included in Chapter 4:

Civil Engineering Integration Committee
Civil Engineering Program Planning and Assessment Committee
Civil Engineering Curriculum Committee
Construction Engineering Curriculum Committee

A complete listing of committee membership is in Appendix A.

3.2 Student Chapters

Associated General Contractors
The Iowa State Chapter of Associated General Contractors (Larry W. Cormicle, advisor) has been busy in 2004 with student meetings, field trips, community service projects, and social events. Participation is at the highest levels on record; with this level of involvement, the chapter hopes to be in excellent position to win the national student chapter of the year award for 2005, as they were awarded the second place trophy for 2003-2004.

The chapter held its monthly meetings throughout the year, with interesting speakers from the industry discussing a wide range of topics. Topics ranged from highway bridge construction to commercial and industrial construction projects. The meetings gave students the opportunity to interact with contractors and listen to issues affecting the construction industry.

The members organized field trips to several construction projects including: the Iowa Events Center in Des Moines, the Masonry Institute of Iowa facility in the Des Moines area, the , John Deere Construction Equipment factory in Dubuque, Iowa, and the Ames Middle School project.

The AGC chapter participated in many service projects benefiting the community in 2004. In the spring, members participated in the adopt-a-highway program. Members also were involved in the annual homecoming blitz build for Habitat for Humanity. Donating blood at the annual fall blood drive was another activity the chapter participated in. The chapter also hosted a Wednesday-For-Lunch during each semester to encourage students of all levels to interact. Members assisted the Salvation Army with their annual fund raising effort by manning the collection kettles and ringing the bells during the holiday season. The high school outreach program continued very successfully with several AGC cabinet officers and members visiting local high schools over Thanksgiving break and presenting the ISU Con E program. Other

outreach activities included visits to junior high schools and Des Moines area high schools. To get junior high minority students involved and interested in engineering, particularly construction engineering at ISU, AGC members hosted 85 children in a competitive engineering activity, known as Science Bound. It is important to ISU AGC to participate in these outreach activities to not only promote construction engineering and AGC itself, but to also represent Iowa State.

The social events held by the chapter provide interaction between students, faculty, and industry professionals. The chapter held Friday-After-Class (FAC) pizza meetings in the spring and the fall to give students and faculty a chance to relax and interact after a week of classes. VEISHEA was another event the chapters participated by entering a float in the parade and hosting a booth on central campus, complete with several pieces of construction equipment. This fall two tailgates at ISU football games were held, one with the Master Builders of Iowa and the other with Associated General Contractors of Iowa.

Iowa State University won the design-build, commercial and heavy civil divisions at the Region IV Associated Schools of Construction competition in October 2004. The Design-Build, Commercial and Heavy Civil teams will advance to the national competition which will be conducted in Las Vegas, Nevada in March 2005. This is the first time in the Region IV student competition that one university has taken all three first place awards, and this is the second time in the history of the national student competition that one university has competed in all three divisions.

The ISU AGC chapter had another outstanding year in 2004, with 160 members. The members are looking forward to building a stronger chapter at Iowa State in 2005.

American Society of Civil Engineers

The main goals of the American Society of Civil Engineers student chapter of Iowa State University are to expose members to the real life challenges of civil engineering, to provide a support network, outreach and contacts for members, and to improve the image of civil engineering as a profession.

Currently, ASCE operates with a cabinet of seventeen civil engineering students. ASCE has two-hundred members, who are greatly encouraged to become active members of which we had a total of 49 this Fall semester. With the institution of a new constitution active membership has become an integral part of ASCE involvement. We have allowed for a semi-restructuring of the leadership of the chapter, in turn providing more ways to take ownership of ASCE and the civil engineering department.

ASCE has been very busy since the beginning of the school year, with various activities including: Concrete Canoe, Steel Bridge, outreach activities, speaker meetings, and social events. ASCE hosts at least one speaker meeting per month where student have a chance to learn about various civil engineering topics outside the classroom from practicing professionals. The programmed events are focused on community, outreach and personal/professional development.

Outreach Activities:

WestPoint Bridge Builder
Trick or Treat for MICA
SWE Haunted House
Boy Scout Jamboree in Des Moines

Social Events:

Fall Camping Trip
Bowling at the Memorial Union
FACs

Professional Development:

Speaker Meetings
Joint Iowa Section-Iowa State University Section Meeting
Midwest Regional Conference
Steel Bridge Competition
Concrete Canoe Competition

ASCE Student Chapter of Iowa State is also very excited about the opportunity to host the 2005 Mid-West Regional Conference to be held March 3rd -5th of 2005. The Mid-West Regional Conference is an annual event that brings together two-hundred to three-hundred students from nine civil engineering programs in Iowa, Minnesota, Southwest Wisconsin, Eastern South Dakota, North Dakota, and Ontario, Canada.

At the conference, students will participate in career and leadership events to broaden their horizons in the civil engineering profession. In addition, the Regional Steel Bridge Competition will be held during the last day of the conference.

Design Build Institute of America (no report)

Geo-Engineering Society

The Geo-Engineering Society (David White, faculty advisor) chapter at Iowa State University had an active year in 2004. During the spring semester, GES sent twelve students to the Minnesota Geotechnical Engineering Conference in Minneapolis, Minnesota, in early February.

The Society also sent four members to the Iowa Section Geotechnical Engineering Conference held in Williamsburg, Iowa, in mid-February. Jeff Magner, P.E. from Terracon in Des Moines, Iowa, gave a presentation on the recent geotechnical work at the Iowa State Capital Building. Pavana Vennapus, an Iowa State University graduate student, also presented his research on optimum base characteristics of pavements. The society finished off the spring semester with a pizza party.

Chi Epsilon

The Iowa State Chapter of Chi Epsilon (David White, faculty advisor) has been busy this year with service projects and fundraisers. We were also excited to welcome 6 initiates last spring and 11 new initiates in the fall. Events this year have included service projects, a golf

tournament, and improved Chi Epsilon Study Sessions.

Every spring and fall, the new initiates join current members of Chi Epsilon for Adopt-A-Highway. Chi Epsilon has committed to cleaning up a two-mile stretch of Highway 30 located east of Nevada. Also, in the fall of 2004, Chi Epsilon helped with Stuff the Bus, a program to raise food for assistance to families in the Ames area. Stuff the Bus received over 300 boxes and $15,000 to donate to these families.

In the spring, Chi Epsilon hosted the 22nd Annual Civil Engineering Spring Banquet at the Basil in Ames. The Civil Engineering Banquet gathered over a hundred students, students' parents, faculty, and civil engineering firms for a dinner that recognized students and featured a guest speaker. The Civil Engineering Department acknowledged several students who achieved awards throughout the Fall 2003-Spring 2004 academic year. The Chapter also recognized their new members. The featured speaker, Mr. Jeff Garrett, a P.E. from Construction Technology Laboratories, spoke about the World Trade Center.

Chi Epsilon hosted the First Annual XE Golf Outing on September 27. This fundraiser was designed to allow students to network with faculty and local engineers and gain some insight into the profession. Several local businesses sponsored the event, including Fox Engineering, McClure Engineering, CTRE, and GSI, Inc. The weather cooperated perfectly for the twelve participants. The money raised from this event will be used for the XE scholarship. We hope that this event can become a Chi Epsilon tradition.

This fall, Chi Epsilon decided to modify the traditional "help room" provided once a week for CCEE students. To emphasize the room as open to anyone and not just those with specific questions, the name was changed to the Chi Epsilon Study Session. Attendance this year has improved as more students meet to study in a group environment.

Finally, Chi Epsilon welcomed six new members in the spring and 11 new members in the fall. As a part of the induction, new members attended an initiation night to learn about the history of Chi Epsilon Honor Society and its four pillars of scholarship, character, practicality and sociability.

Transportation Student Association

Transportation Student Association (TSA) (Reg Souleyrette, Ed Kannel, and Shauna Hallmark, faculty advisors) has provided students interested in transportation with a number of professional activities and opportunities. TSA helps members to make professional connections and experience the transportation industry on both the local and national level. As the parent organization of the Institute of Transportation Engineers (ITE) and the Intelligent Transportation Society of America (ITS-A), TSA also allows students to be involved with two nationally recognized organizations.

Of special note, TSA recently participated and won the Student Competition associated with the Missouri Valley ITE Section (MOVITE) Spring Conference. The MOVITE includes universities from 6 Midwestern states. TSA also participated in Iowa State University's VEISHEA celebration by setting up a booth under Cy's Big Top. The booth consisted of a

matching game that teaches children about traffic signs. Thanks to generous sponsors, all children participating in the activity received a prize.

TSA kicked off the fall semester with a welcome back barbecue during the first week of classes held at Brookside Park, with an estimated 50 people stopping by! TSA continues to incorporate transportation professional presentations into its general meetings, held bi-weekly during the academic year. The 8th annual TSA sponsored golf outing gave students an opportunity to mingle with transportation professionals in a business-casual setting.

In September, 5 TSA members attended the bi-annual MOVITE Conference held in Oklahoma City. Students attended presentations and met professional engineers from the Missouri Valley Region.

In January, 13 TSA members attended the Transportation Research Board (TRB) meeting in Washington, D.C. Students attended presentations and were able to meet with students from other universities. Students also had an opportunity to tour the nation's capital.

TSA members have also participated in a number of community service projects. Members are currently serving as mentors for junior high students participating in the Future Cities competition, an activity in which junior high students design and build future cities. Upcoming activities include work zone safety presentations given to driver education classes at local high schools during April.

Sigma Lambda Chi (SLC)

The Construction Engineering honor society, Sigma Lambda Chi, has been extremely active this year. Eleven students were initiated bringing the total membership to 23. Throughout the year, Sigma Lambda Chi gave Hotel Lego presentations to over 300 students and presented to 50 seniors for Senior Visitation. Furthermore, Sigma Lambda Chi helped advise the ConE 101 class and helped to judge the Associated Builders and Contractors Excellence in Construction awards. In addition to the volunteer activities, Sigma Lambda Chi holds several social activities. These activities include guest speakers and Friday After Class (FAC) pizza outings. A golf outing is planned for next year.

Mechanical Contractors Association

The student chapter of the Mechanical Contractors Association of Iowa had a very active year. The club held regularly scheduled monthly meetings and significantly built their membership to 25 standing members. In the spring 2004, four members along with their faculty advisor attended the MCAA annual national convention were they participated in meetings and networking opportunities. In the fall 2005, four students attended the student summit in Wisconsin. The club also hosted a tail gate, a golf outing, and a barbeque fundraiser. The biggest accomplishment was their submission to the national student competition. Although they did not place, this is the first time in club history that the students were complete the project.

National Electrical Contractors Association

In the spring 2004 the NECA student chapter held their annual scholarship interviews with the Iowa Chapter of NECA. One member was subsequently selected at the scholarship recipient. In

fall 2004 the club attended the annual meeting of the Iowa Chapter NECA. Four students and their faculty advisor attended this event.

3.3 Advisory Councils

CCEE Advisory Council
The CCEE Advisory Council consists of:

Tammy Nicholson (chair), Iowa DOT, Ames
David Fox, Fox Engineering, Ames
Jolee Belzung, City of Ankeny
Glen Ferguson, Geosystems Engineering, Inc., Lenexa, Kansas
Rick Tollakson, Hubbell Realty, Des Moines
Sandra Larson, Iowa DOT, Ames
Dwayne Garber, Marshalltown Development Company
William Anderson, American Academy of Environmental Engineers, Annapolis, MD
Matt Streeter, Water Link, State Center
Scott Werner, EFCO Corporation, Des Moines
Scott State, MACTEC, Inc., Golden, CO
Mike Helms, Shive-Hattery, Inc., Moline, IL
Craig Denny, Terracon, Lenexa, Kansas
Jack McGuire, The Boeing Company, Seattle, Washington

The CCEE Advisory Council met twice during 2004. Craig Denny and Jack McGuire joined the Advisory Council.

The April 23rd, 2004 meeting began with time for Council members to meet with and interview small groups of students. The student interviews told us highlights of the department including; integrated curriculum, quality of instructors, sense of community among students, extra-curricular activities and groups, teamwork, and the openness of the department to student input and suggestions. The students also suggested areas that could be enhanced, including; additional information on all aspects of Civil Engineering be shown to freshman students, concern with not including technical classes in the curriculum such as CADD, classes that are too large with combined lecture groups, and make sure the "why" of each course is explained well at the beginning of the course. The Council also attended the final group presentations for CE 486 Capstone Design. Larry Northup presented information regarding new student e-Portfolios and the role that the Advisory Council may be able to serve.

On November 5th, 2004, the Council held its first joint meeting with the University of Iowa's Civil and Environmental Engineering Advisory Board. Department Chairs from both universities presented information on the strengths and challenges of the two departments. The two advisory groups identified ways to enhance collaboration between the groups including sharing the names of graduates that could be utilized for mentoring and practitioner involvement. Collaboration in developing curriculums is another area where the groups could provide input. We plan to hold another joint meeting in Spring 2006. Following the joint meeting, the CCEE Advisory Council met separately to review alumni awards that are available, speak with Charles

Glatz, Interim Dean, and discuss a Performance Plan for CCEE. The Plan is in development and a draft will be presented to the Council at the Spring 2005 meeting.

Construction Engineering Advisory Council

The Construction Engineering Advisory Council is made up of:

John Adams, Iowa DOT, Ames
Paul Campbell, M. A. Mortenson Company, Minneapolis, Minnesota
Ken Bonus, The Weitz Corporation, Des Moines
Jim Estes, Estes Company, Davenport
Michael Gawley, Oakview Construction Company, Omaha, Nebraska
Mark Guetzko, Seedorf Masonry, Inc., Manchester
Bradley Heemstra, Story Construction Co., Ames
Larry Hopp, Kiewit Construction Co., Omaha, Nebraska
Stephen Jackson, Cedar Valley Corporation, Waterloo
Paul Johnson, The Beck Group, Dallas, Texas
Kent Meyn, ACI Mechanical, Inc., Ames
Dave Miller, The Waldinger Corporation, Des Moines
T. J. Meiners, Nelson Electric Company, Cedar Rapids
Jim Nissen, Pepper Construction Company, Chicago, Illinois
Skip Perley, TEC-CORP, Sioux City
Cork Peterson, Peterson Contractors, Inc., Reinbeck (Chair)
Gene Postma, EFCO, Des Moines
Dirk D. Schaefer, J. E. Dunn Construction Company, Kansas City, Missouri

A strategic plan was developed for the Construction Engineering advisory Council: The following members of the construction industry advisory council met on February 27, 2004: Roy Park, Charles Jahren, Derek Hemphill (recent graduate), Kelly Strong, Kevin Jones, Mark Guetzko, Larry Hopp, Jim Nissen, Skip Perley, Cork Peterson, Gene Postma, Dirk Schafer.

According to the advisory council's strategic plan, the ConE Industry Advisory Council to have a more active executive committee and to have subcommittees that look after each major objective in the strategic plan. These subcommittees will have phone conferences and provide discussion materials for each one of the objective areas prior to each advisory council meeting. Members were assigned according to their first or second preference on the survey taken at the April 2004 advisory board meeting.

Executive Committee:
Cork Peterson (President)
Mark Guetzko
Jim Nissen
Brad Heemstra (Local Member)
Chuck Jahren (Ex-officio)

Advise Support and Evaluate Program Output and Direction
Rhonda Wiley-Jones

Todd Sirotiak
John Negro
Dirk Schafer
Dave Miller

Assist faculty in Developing Sufficient Resources to maintain and strengthen the program (Development/fundraising, same as Construction Engineering Program Excellence Committee)

Glenn De Stigter
Cork Peterson
Paul Johnson
Chuck Jahren
Dirk Schafer
Paul Campbell

Highlight critical issues and trends within the industry to help insure the program maintains its "leading edge"

Kelly Strong
Mike Gawley
Paul Campbell
Larry Hopp

Provide direction and support for a research and technology transfer program

Ed Jaselskis
Skip Perley
John Adam
Jim Nissen

Promote the construction engineering program to contractors, the industry, potential students Iowa State University administration and other Universities

Larry Cormicle
Gene Postma
Steve Jackson
Brad Heemstra

The Construction Engineering Advisory Council had two regular meetings in 2004 in addition to the strategic planning meeting.

The first meeting was held on April 23, 2004. The result of the strategic planning session was the primary topic for this meeting. In addition, the following was discussed:

- Results of freshman and senior interviews
- Plans to launch a construction engineering learning community in Fall of 04
- Review of program objective and outcomes for insertion in the next catalog and for ABET documentation.

The second meeting was held on November 7, 2004. According to the request of the advisory council, Dr. Jahren provided a narrative summary of progress since the last advisory council meeting. The meeting agenda was changed to reflect the new objectives that flowed from the strategic plan with each subcommittee reporting the results of its discussions. In addition:

- Glenn De Stigter passed the chairmanship to Cork Peterson; Glenn is now a member of the College of Engineering Advisory Council and will coordinate his activities with the ConE Advisory Council.
- John Negro of Nelson Electric will be replaced by T.J. Meiner of the same firm; T.J. is a ’02 graduate which fits with the desire of the advisory council to have representation from recent graduates. John will continue to serve as an alternate.
- The results of freshman and Senior Interviews were discussed.

3.4 Facilities Enhancement

Room 136 was completely remodeled for graduate student space with new furniture, lighting, wiring, and carpeting. The Livesay Structural Materials Testing Facility was completed and dedicated. Our internet service was upgraded to T100 base. A high definition plasma monitor was installed in the lobby.

4.0 UNDERGRADUATE PROGRAMS

4.1. Civil Engineering Integrated Curriculum.

With the Accreditation Board for Engineering and Technology (ABET) review and the implementation of the Integrated CE Curriculum, the Civil Engineering program made significant changes to the undergraduate curriculum. These changes have been continually assessed as part of our continuous quality improvement process.

4.1.1 Civil Engineering Integration Committee

Assessment and Improvement

The Civil Engineering (CE) Integration Committee began a phased implementation of the Integrated Curriculum in the Spring of 2001. Although this revised curriculum is still relatively new, all of the courses have been offered at least twice. Therefore, the committee has been assessing these courses and implementing the continuous quality improvement process.

The assessment included evaluation of surveys completed by industry representatives, alumni, and students; focus groups of sophomore, junior, and senior students; writing sample evaluations; CE 403 course input; and midterm and end-of-year course evaluations. The evaluation of the assessment data led to several quality improvement efforts. Most of these quality improvement efforts involved small revisions to course content. Some of the small revisions included adding more case studies, eliminating redundancies, reinforcing concepts, and adding more practicing professional/student interaction.

The most significant change in the integrated curriculum was the addition of CE 485 in the 2003-2005 catalog. This two credit course supplements CE 486, the capstone design course. Previous assessment data showed the capstone design experience was very beneficial to the students. However, the instructors had a difficult time covering the material in a single three credit course (CE 486). The addition of CE 485 has allowed students more time for the planning and design phases of their projects.

A listing of the courses in the integrated curriculum is included in Figure 4.1.

Collaboration

The committee has continued their collaboration efforts with representatives from the Department of English. This collaboration has strengthened previous efforts, such as emphasizing technical communication within the integrated courses, continuing assessment of communication, and updating the implementation strategy to provide students with the communication skills that are essential to be successful in the workplace. The collaboration also led to some new accomplishments, including the have developed an initial matrix (Figure 4.2) that identifies the required civil engineering courses and the communication elements applicable to each course. The matrix allows the department to evaluate the results, develop recommendations, and implement any changes that would lead to the optimal integration of communication in the curriculum.

COURSE	CONTENT

Engr 101	(R cr) Introduces objectives, learning process and provides access to engineering professionals.
CE 104	(1 cr) Introduction to CE projects and practices. Field trip. Beginning of technical writing instruction. Teams and ethics.
CE 160	(3 cr) Engineering problem solving and presentation. Use of spreadsheets for problem solving. Graphing and visual design. Start of engineering economy instruction and application.
CE 170	(2 cr) Graphics with applications in hand and AutoCAD methods. Computer aided modeling for civil engineering.
CE 203	(2 cr) Integration of topics from mathematics, chemistry, physics and engineering mechanics in civil engineering applications. Continued work with technical writing and engineering economy. Participation in ASCE student chapter.
CE 204	(2 cr) Application of mathematics, chemistry, physics, engineering mechanics and engineering economy to advanced civil engineering problems. CE technical reports. Sophomore assessment.
CE 303	(2 cr) Professional issues in civil engineering. Leadership, team building and TQM. Engineering business management. Project management. Engineering economy applications. Engineering ethics, law and regulation.
CE 304	(2 cr) Civil engineering design and construction. Project planning. Managing design. Agreements and contracts. Construction. Project management and communication. Case studies. Junior assessment.
CE 403	(R cr) Outcomes assessment. Review and assessment of the CE curriculum from senior students.
CE 453	(4 cr) Capstone highway design. Group projects.
CE 485	(2 cr) Capstone planning and design including environmental impact and preliminary design. Synthesis of previous coursework in a group project.
CE 486	(3 cr) Capstone design including final design, cost estimating, and planning and scheduling. Synthesis of previous coursework in a group project.

Figure 4.1 Integrated Courses Listing

	Lib Eng				REQUIRED COURSES								
	160	101	104	111	160	170	203	204	303	304	326	332	…
REPORTS:													
Lab/Testing/Technical estigations				xxx							xxx	xxx	
Field trip reports			xxx									xxx	
Presentation/speaker summary			xxx										
Technical (studies/design/research)					xxx		xxx	xxx					
Literature reviews		xxx											
Research summaries	xxx	xxx											
PROPOSALS/RELATED DOCS:													
Request for proposals										xxx			
Technical proposals										xxx			
Scope of services, work plans										xxx			
Cost estimates/project bids										xxx			
CORRESPONDENCE:													
E-mail			xxx						xxx				
Letters/memos							xxx	xxx					
…													

Figure 4.2 Sample of Communication Matrix Elements

Additional collaboration efforts were conducted with the ISU CE Advisory Committee. Through this collaboration, the ISU CE Advisory Committee agreed to assist the Integration Committee in evaluating civil engineering student portfolios.

Promotion

The committee has been very enthusiastic about the changes in the civil engineering curriculum and took advantage of opportunities to promote the integrated curriculum to others in academia and industry. Committee members promoted the curriculum by making presentations at conferences such as the national American Society of Engineering Educators (ASEE) and the national American Society of Civil Engineers (ASCE) annual conferences. The feedback from these presentations has been very positive. Others in academia and industry have a strong interest in our efforts and are looking forward to future assessment information.

After a presentation at the national 2002 ASCE Annual Conference, the Department was visited by the ASCE Task Committee on Academic Prerequisites for Professional Practice. The ASCE Task Committee discussed the proposed Body of Knowledge (BOK) for realization of Policy Statement 465 with the ISU CCE faculty. The ASCE Task Committee asked CCE faculty to be one of the

invited universities to design a curriculum which will provide the BOK. The CCE faculty has accepted this invitation and has been instrumental in developing model curricula to satisfy the BOK.

Future

Assessment of the integrated curriculum has been difficult since the curriculum is still relatively new and many of the students are graduating with different phased requirements to fulfill the program, rather than having taken all of the new integrated courses. Assessment of the integrated curriculum is also challenging since the evaluation includes many professional practice skills, such as leadership, teambuilding, and ethics, which are more difficult to assess. We are looking forward to receiving feedback from students who have been through the whole curriculum and the industry representatives who hire those students. Until then, we will continue our assessment and improvement efforts to assure the integrated curriculum is successful.

Conclusion

The civil engineering faculty have implemented bold initiatives to change the way undergraduate students are taught in the revised, integrated curriculum. The results of that change have been very positive. The faculty will continue to provide the integrated program through the current civil engineering courses. An evaluation of those courses demonstrated that the curriculum is relevant, connected to the profession, and satisfies all of the departmental education objectives. Of course, the faculty also recognize that minor modifications to the courses will be beneficial to meet the needs of the students and industry representatives who hire those students. Therefore, faculty will implement continuous quality improvement to assure the curriculum continues to meet all the requirements and successfully prepare the graduates for engineering practice in the 21rst Century.

4.1.2 Civil Engineering Program Planning and Assessment Committee

Background

Assessment within the Civil Engineering program continues on several levels using faculty members, faculty committees and a variety of tools or measures to assess the development of our students. Individual faculty members directly assess the learning within the classes using direct measures from projects and examinations. The curriculum committee reviews the overall structure of the curriculum, and student course selections to ensure that the student programs comply with the general education and technical skills required in the engineering environment. The Advising Committee works with the Advising Center Coordinator and student representatives in an effort to ensure that students have sufficient guidance in developing their programs, selecting courses, and seeking cooperative education and international studies to meet their education objectives.

Based on input from faculty, students, alumni, employers, and the Civil Engineering Advisory Council, the program has been working to strengthen the program in areas of communication and engineering project management. The overall objective has been to integrate these skills throughout the freshman through senior courses rather than relying on senior year courses and projects to provide the experiences desired in the educational program. The Integration Committee, chaired by Marlee Walton, has been continuing the development of the five semester sequence that develops these skills.

The purposes of this report are to review the progress in program development and to present on-going adjustments in the evaluation procedures. The report presents results from several measures used to evaluate the progress of our students, but highlights current efforts to critically review our assessment strategies and identify changes that are occurring in the assessment tools the civil engineering program is using. The latter element was driven by the recognition that a significant portion of the assessment plan was based on student surveys which were intended to obtain student's assessment of the degree to which the educational objectives were covered in the courses. The accreditation authority, the Accreditation Board for Engineering and Technology (ABET), identifies such surveys as weak measures of assessment. Evidence from direct measures, such as student portfolios, content examinations, engineering fundamentals examination results, and work-place evaluations of cooperative education and internship students should be the focus of program assessment. This report summarizes results from on-going assessments and the work underway to adjust the assessment tools.

The program review continues to include the active involvement of faculty, students, alumni, employers, and our Civil Engineering Advisory Council which has representatives from professionals in engineering consulting, industry, and government. The report is organized to first present results observed from the on-going assessment processes and then to discuss the steps undertaken to examine alternative assessment strategies.

Program Assessment Results

The October 2003 Integration Committee (Walton) report discusses the results of the course outcomes reviews including the strategies used to assess the students' progress. The Planning and Assessment committee report does not repeat those data, but will report on data from direct measures including Fundamentals of Engineering examination results, graduate placement, cooperative education evaluations by employers, and an alumni survey.

Fundamentals of Engineering

Civil engineering graduates continue to be very successful taking the national Fundamentals of Engineering (FE) examination. Although not a requirement within the program, approximately 90% of the graduating seniors take this first towards professional licensure. In the past two years the passing rate averaged 98%, compared with the national average for peer institutions of approximately 80%. The examination components of particular interest are the results from the PM section of the examination which deal directly with the civil engineering instruction elements. Table 1 graphics show the changes in each of the PM subject areas for the eight exams from Fall 2000 through Fall 2003. While variations in any single subject area exam may be large the committee directs special review if

a) The general trend is negative, or
b) The scores in a subject area drop below the national average, even in a single exam period.

The most recent reviews show positive trends in areas of construction management and computers/numerical methods. The first of these has been a focus area within the program. The

Table 1 Fundamental of Engineering examination score trends

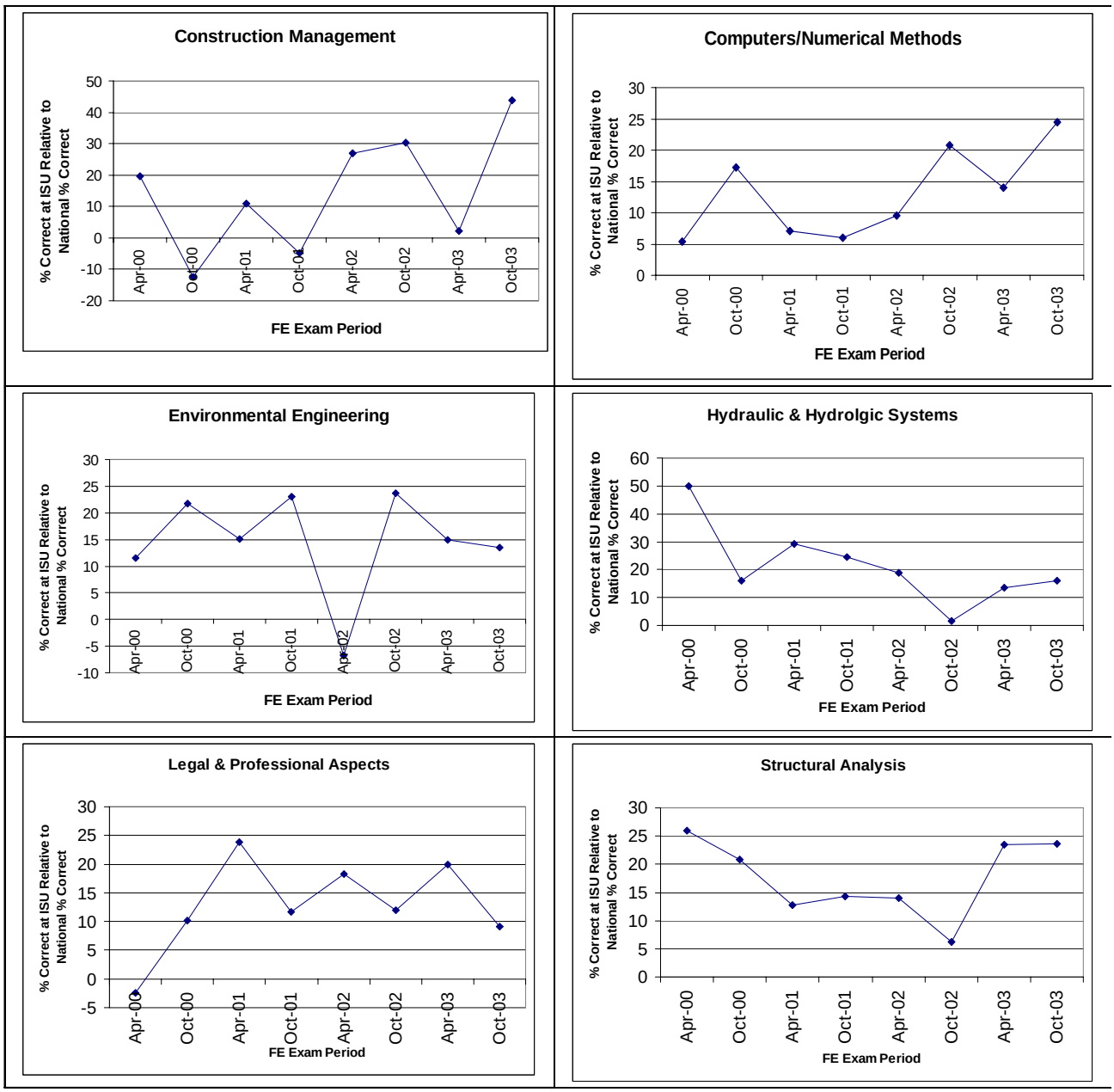
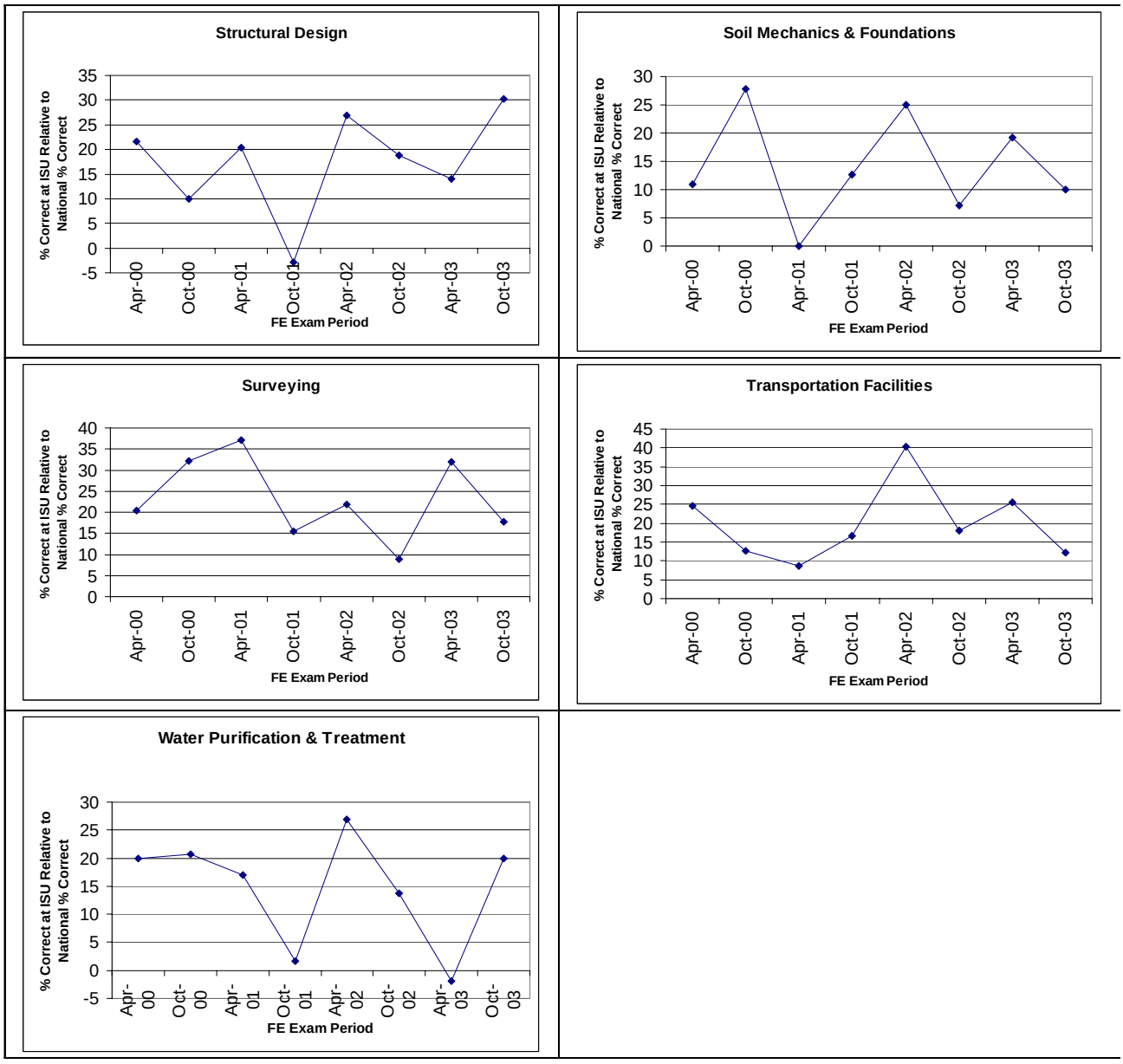


Table 1. continued



improvement in computer/numerical methods may be associated with the change in our curriculum as civil engineering replaced the third semester of calculus with a course in numerical analysis in the1999-2001 catalog.

The other area of negative trends appeared to be in the hydraulic and hydrologic systems. Faculty resources may have influenced this somewhat as Dr. Al Austin, division leader in environmental and water resources, assumed leadership in the senior design class. The apparent downward trend, however, is not as great as it appears. In the first period on the graph the ISU scores were 50 % above the national average. Later periods show that students were scoring

approximately 20% above the national average. This range is within the range for other areas of instruction in the program. The department has been undergoing a national search to add a faculty member in the water quality/water resource area of the department.

Professional career following graduation

The College of Engineering Career Services Office maintains the record of students who have selected an employer or chose to continue in graduate school. The data are provided one week before commencement. Table 2 shows the data for the past two year period. Although the placement rate was down in 2003, the department's placement rate remains above the College average.

Table 2 Civil Engineering Placement trends

	Sp - Fall	Sp - Fall	Sp - Fall
	2001	2002	2003
Number	69	75	79
% Placed	85	83	73
College Avg. % placed	75	66	60

Background for Ability-Based Outcomes Assessment

The Career Services Office within the College of Engineering, with participation from employers, faculty and students, and a software provider (Development Dimensions International, Inc.) has created an evaluation tool that allows employers to rate the competencies of students at the work site. The study participants selected key ability-based skills, an original set of 14 "ISU student competencies" that have been linked to the ABET accreditation outcomes. Cooperative education employers have since provided feedback to the student and the college which assess the degree to which these skills have been demonstrated in the workplace. The fourteen key competencies (plus a recent addition, totaling 15) are:

Number	Competency Summary Descriptors
1	Analysis & Judgment
2	Communication
3	Continuous Learning
4	Cultural Adaptability
5	Customer Focus
6	Engineering Knowledge
7	General Knowledge
8	Initiative
9	Innovation
10	Integrity
11	Planning
12	Professional impact
13	Quality Orientation
14	Teamwork

15 Safety Awareness

Supervisors rate the employee on a 1 to 5 scale regarding the degree to which each of several sub-elements of the skill set are being demonstrated. Students also provide a self-reflection of their own growth in each of the categories. The standard question format and scoring range is:

How frequently does the employee demonstrate _____....____ skill?
1 Never or almost never
2 Seldom
3 Sometimes
4 Often
5 Always or almost always

Data from each of the ability areas are available, by semester, for a three year period. At this time the employer response data are available only as averages for all civil engineering students in the program. The average data, however, are satisfactory for overall program review.

The competency scores were divided into top five and bottom five lists, plus the middle third. The committee was particularly interested in noting competencies that were consistently ranked at the low end, and for skills in general that program adjustments could be made to improve the performance.

Results from 2002 and 2003 were as follows:

Competency	Times in lower third
Innovation	4 of 4
Communication	3 of 4
Customer focus	3 of 4
Initiative	3 of 4

The lower placement for innovation and customer focus was felt not to be surprising since the coop students are new to the engineering environment. Of greater concern was the placement of Communication since we are focusing on this aspect in our curriculum. The sub questions were carefully reviewed. The review showed that the communication questions were slanted to oral communications (diction, eye contact, response to questions) than the written or graphic communication. At this time, oral presentation skills are developed most frequently in the senior design project courses. As discussed later, the committee plans on using a similar survey for alumni and their supervisors five years after graduation. We will be looking to clarify the differences between the written and oral capabilities of the student. Finally, although we will continue to track progress in this area, the average communication score from supervisors was 4.5, which midway between “demonstrates the skills often” and demonstrates the skill “always or nearly always”.

On the other end of the scale, competencies that were always listed in the top five were Engineering Knowledge and Integrity.

Alumni Surveys

In Fall 2003, an alumni survey from students who graduated the Fall 2000 /Spring 2001 was conducted. The forty-five question survey was a basic replicate of the survey used in the department for graduating seniors in which the department sought judgments about the quality of program in preparing them in several areas of development. The areas examined included the technical subjects as well as teamwork, leadership, communications and related items. The alumni rated over 40 aspects of their program at ISU using a scale that went from

1 = Poor 2 3 = Satisfactory, 4 5 = excellent.

Again full details are not presented in this summary report since the results mirrored the topic areas the department has been focusing on, i.e., the alumni felt the preparation in construction management was not strong. The four areas in which the average scores were less than satisfactory were:

1. To design and conduct and experimental program (e.g. selecting and appropriate ASTM or other standard to design a test program for material behavior) (score = 2.6)
2. To consider potential operations and maintenance problems over the design life of a civil engineering project (score = 2.7)
3. To apply planning and scheduling principles (score = 2.8)
4. To apply principles and practice of business management (score = 2.8)

Overall, the alumni rated the Communication areas higher.

- Graphic communication (4.4),
- Written/oral communication (3.9) preparation were [written and oral components were not specifically separated in the original questionnaire].

Experimental design and life-cycle engineering concerns are areas that had not previously been a focus point; these areas will be addressed in the continuing review.

Assessment Direction

The Planning and Assessment committee continues to review the input from the courses, fundamentals exams, and reviews, surveys presented in this summary report and encourage changes where appropriate. Throughout the process we have examined civil engineering program's educational objectives and looked for alternative strategies for measuring the success of the program to meet the objectives. During this period, terms such as objectives and outcomes have been more carefully defined by the accreditation board (ABET). The ABET student outcomes, often identified as the (a) through (k) outcomes of ABET Criterion 3 are now specified as the skills the students are expected to have at the time of graduation. Objectives are the characteristics that the student/alumni/engineer is to have developed at a later point in his or her career (five years out).

Review educational objectives

In 2002 the Civil Engineering faculty and our Advisory Council revisited and modified our Educational Objectives recognizing that some stated objectives were means to achieve our goal rather than an educational objective by itself. For example, the objective of providing a strong advising program was removed as a published objective. The department continues to review,

modify, and improve our advising program, but we don't include it as an educational objective for the students. At this time we recognize that the new objectives still do not totally meet the new ABET distinction between long term objectives and the shorter-term outcomes to be achieved at graduation. Therefore the Assessment committee will again seek revisions in our published objectives to be consistent with the distinctions between objectives and outcomes.

Direct measurements –Portfolios

A recognized method of tracking student growth is the use of electronic portfolios for students to archive materials that demonstrate that desired outcomes / skills are being developed and for them to reflect on their progress. The concept of portfolios and the need for assistance in assessing the final products has been presented to the CE Advisory Council (Spring 04). The council encouraged advancement of this assessment strategy and offered assistance in providing outside reviews. The Planning and Assessment Committee is proceeding with the implementation, building on the experience of the Agricultural and Biosystems Engineering faculty who are developing a system for their program.

Implementation of the portfolio will initially be limited to new students in our integrated curriculum (CE 104) and will be limited to two elements of our educational objectives

1) Communication
2) Professional development (resumes, leadership, student organization involvement, etc.)

As student and faculty familiarity increases, the scope may be expanded.

4.1.3 Civil Engineering Curriculum Committee

During 2004, the Civil Engineering Curriculum Committee accomplished three main tasks: finalizing the 05-07 catalog, preparing an articulation agreement with Lanzhou Jiaotong University (LZJTU), and reviewing student curriculum petitions. One additional objective was to evaluate the concurrent B.S./M.B.E. program in civil engineering. The committee is preparing a course template and plans to make a recommendation to the faculty council in early 2005 with regard to the concurrent B.S./M.B.E. program.

The main activities in preparing the articulation agreement with LZJTU involved assessing the first two years' courses at LZJTU. Courses with adequate information on the content (e.g., course syllabi) were assessed for transfer credit evaluation and course coverage. Several course could not be adequately evaluated and the students will either apply for credit by examination (e.g., for Physics 221 and 222) or have the course evaluated when they arrive (e.g., for EM 274). There will be ongoing cooperation between the two Universities to incorporate elements of CCEE's integrated curriculum into the first two years of LZJTUs curriculum. Other aspects of the agreement include admissions requirements (e.g., GPA and TOEFL scores, a PowerPoint presentation, and a live interview). The number of admissions to the 2+2 Bachelors program will be limited to twice the number of candidates registered in the 4+2 Masters program. Initially for Fall 2006, a maximum of six 2+2 Bachelors and three 4+2 Masters students are expected.

The curriculum committee also reviewed and approved an experimental course for CE 576X Environmental Flows submitted by Chris Rehmann.

4.2 Construction Engineering Curriculum

During the past year, the Construction Engineering Curriculum Committee continued to review several petitions and continued to make improvements based on comments from students, advisory board members, and alumni. We have implemented additional systems to assist the students in petitions, transfers, and requests for modifications. After having accelerated ConE 251, improvements can be seen as relating to mechanical/electrical issues. There is now a greater distinction between the mechanical and electrical emphasis as reflected in the new catalog. We have also introduced Con Es with an electrical emphasis to more electrical engineering courses. After providing more technical elective flexibility for the Heavy Emphasis with additional accredited classes we have also opened up more options in our Engineering Technical Elective section and subsequently increased our enrollment in graduate classes with classified undergraduates. This dynamic group is further investigating additional enhancements to how classes exchange information, assist the students in their potential resume and internship skills, and have also helped coordinate the implementation our Cornerstone.

4.3 Common Activities

Several faculty members continue to implement and experiment with new learning methods and student participatory techniques. Each faculty member is working to adopt a teaching/learning style that benefits the students and fits his/her personality. Some new faculty members have attended sessions at ISU sponsored by Center for Teaching Excellence and others have attended ASCE ExCEEd workshops. Appendix C lists several activities in our courses that enhance student learning.

Course and instructor evaluations are collected from students in all courses (see Appendix C) and maintained with the vita records of all faculty members. They are reviewed by the chair and appropriate action recommended. Peers and mentors are evaluating the teaching of the new faculty members and suggesting methods of improvement.

In addition to teaching awards presented by the college and the university, three awards are presented by the department (Joseph and Elizabeth Anderlik Award, the Charles W. Schafer Award, and Chi Epsilon James M. Robbins Excellence in Teaching nomination) that recognize teaching quality. The students within each curriculum also vote for Outstanding Professors (see Appendix A).

4.4 Computers in the Classroom

Improving the implementation of computers in the classroom is a continuing effort. All classes involve use of the computer in one way or another. Changes in software and technology create demands for continually updating the courses. In addition to spreadsheet and word processing software, the following software is in use in our classes:

AutoCAD for engineering design (limited use only by students)
Autodesk Architectural Desktop for building design
BioWIN to design and analyze wastewater treatment systems
BRSLUG for slug testing

Cooper Luxicon for lighting design
ENVELOPE for structural design
Geographic Information Systems for highway planning, environmental impact analysis and drainage analysis
HCSS, Hard bid and Bid (experimental stage)
HEC-1 for hydrologic modeling
Microsoft Office 2003 Professional Products
MicroStation for graphic design
MicroStation and GeoPak survey for highway design
Noise analysis and Pavement Design software for highway design
On-Center, on line take-off system for estimating
Primavera Project Planner P3.1, Sure Trak 3.0b, and Microsoft Project for project scheduling
RAM program for advanced concrete design (experimental stage)
Reaction time simulation for Highway design
Sigma/W and Slope/W for soil analysis
STAAD-III and ANSYS for structural analysis
Timberline for detailed cost estimating
STASOFT to model water treatment
TransCAD (a GIS based Transportation planning software) for an elective transportation planning course
TransCAD for travel demand modeling

More faculty members are using WebCT to provide syllabi, lecture notes, term paper requirements, supplemental course material and problem solutions, and to submit final grades. Some use the web and email to answer student questions.

CCEE Extension uses a wide variety of computer support for its workshop offerings. For example, the Hydraulic Design of Culverts workshop focuses on the fundamental design procedures for determining runoff from storm events and the design of drainage structures (culverts) to convey the runoff discharge under highway and secondary road embankments. Students are trained in the traditional use of design charts and nomographs as well as hydraulic design software. Software used for this course includes FHWA HY-8 Culvert Design, Haested Methods CulvertMaster, the Iowa Culvert Program (IA DOT), and the NRCS TR-55 (Urban Hydrology for Small Watersheds).

4.5 Recruitment

Civil Engineering

Experience Iowa State, which is a series of campus visits by groups of potential students and their parents, is scheduled eight or nine times each semester. We help host these events by meeting with any students, and their families, that have indicated an interest in either Civil or Construction Engineering.

Two Open Houses were held in conjunction with Engineering 101 to inform undecided students about Civil and Construction Engineering. Faculty, staff and students already in our programs

gave presentations and answered questions from undeclared engineering students interested in Civil (CE) or Construction (ConE) Engineering. Departmental faculty and staff have also been involved in various recruiting activities to encourage women to enter the science and engineering fields.

Preview Day and Scholar's Day were held jointly in February. Preview Day honors and recognizes new scholarship recipients who are minority students and gives them an opportunity to experience campus life. Many other high achieving students being similarly honored then join them the next day for Scholar's Day. Presentations and demonstrations were given for any such students, and their parents, that were interested in CE and ConE. Members of the ACSE student chapter assisted with the CE presentations.

Senior Visitation Day, held in September in conjunction with E-Week, is targeted at interested high school seniors and their parents. There were presentation sessions, hosted by faculty, for students and guests interested in either CE or ConE. Once again members of the student chapters assisted with the presentations. The sessions also included small group tours of the computer, geotechnical and structures labs.

Engineering Honors Workshop (EHW) was held three times during the summer. High school honor students had the opportunity to visit campus and experience what challenging activities Iowa State has to offer them. Students visiting our department did a bridge design exercise in one of our computer labs using the West Point Bridge software, and also visited a construction site.

Both CE and ConE involve underclassmen wherever possible in recruitment by inviting them to participate in information sessions, tours and demonstrations. They relate their own experiences and the opportunities they find at ISU with much enthusiasm and a very relevant perspective.

Welcome and invitation letters are sent to all persons admitted into Civil and Construction Engineering. Special letters were sent to all admitted applicants who are Merit Scholars or finalists. Personal visits, some arranged directly and some through the Campus Visits office, were held with a significant number of prospective students who visited the campus, usually with one or both of their parents. All students who attend summer orientation meet with an advisor. As part of orientation, faculty members also visit with the parents at scheduled "coffees."

Efforts are continuing to improve recruitment for our graduate program by adding financial enhancements and contacting undergraduate students at regional universities. As this program continues, we hope to attract several students every year from these universities. In addition, once or twice a year our top undergraduate students are invited to an informal information session to learn more about our graduate programs over pizza and pop.

Construction Engineering

A packet of materials is available for prospective students who visit ISU Construction Engineering. The packet addresses the academic program requirements and courses, but also student organizations, women in construction engineering (given only to female prospective

students), and a list of ISU websites that may be useful to students as they are making a final decision. The packet is updated at least once a year and more often, as needed.

Current ConE students often meet with the advisor and prospective students, when prospective students are in for Experience Iowa State days. At times when female students are visiting and are unsure about construction engineering, current women students are asked to join the advisor in meeting with prospective female students and their parents.

The ConE advisor records each student visit by asking the student to complete a form that provides information on the student, but primarily provides the advisor an email address from which to send a follow-up email thanking them for coming to visit ISU Construction Engineering and offer any other thoughts or follow-up needed by that individual student. (Analysis of this data against who actually declare ConE as a major and comes to ISU has not been conducted.)

"Scholars Day" in February is an event in which two faculty members share with high school students recent technology used in construction engineering in an informational session.

During "Engineering and Beyond" during June each summer, a faculty member escorts high school students to a construction site on campus or adjacent to campus to illustrate the construction process and what an engineer does for a job.

The CCEE website is a perfect avenue for recruitment. Several endeavors have been undertaken this year to add to the website and/or improve it to better serve prospective students.

1) The academic advisor and departmental web master submitted a proposal for a Professional and Scientific employee grant, specifically for recruitment and retention. The grant was approved for $2750.00, half the amount requested. With that funding, we are videotaping five graduates of the ConE program that illustrate to prospective students the nature of work for construction engineers. The video is designed to answer the most frequently asked question, "What does a construction engineer do?" Taping was conducted during November. Editing is currently in development. Plans are for late spring or early summer viewing.
2) An FAQ site for transfer students that guide them through the process of visiting campus, applying to ISU through the Admissions' Office, checking transfer plans and transfer equivalencies in the Construction Engineering curriculum, and developing a graduation plan with resources from this site.
3) The scholarship process and the number and amount of scholarships given in ConE is located on the CCEE website, both to aid current students in applying for scholarships and to exhibit to prospective students what level of scholarships is available once here and the kind of assistance ConE provides to students in the application process.
4) Several forms either have been placed on the website or have been linked to other websites at the university that can be useful to prospective students.

The Cornerstone Learning Community is one of the strongest potential recruitment tools we have available in Construction Engineering. Students like being in learning teams that share common courses. Parents like knowing that their student has opportunities to succeed that are orchestrated

by the faculty and staff in their curricula.

Recent research on the students coming directly from high school, who are currently enrolled in universities, is known as “millennials”. They have a strong bond with parents and are highly influenced by parents in their decision-making. A conclusion of the research that affects university recruitment directly is, “if you aren’t recruiting parents, then you aren’t recruiting students.” Learning Communities fit this bill.

The Cornerstone Learning Community seeks to get students acquainted with other students directly from high school cohort students, with ConE faculty and staff, and provide guidance on frequent freshmen issues, such as use of time management, balance of priorities, development of studying skills, and surviving increased independent living.

4.6 Retention and Advising

Civil Engineering

Our primary emphasis toward enhancing retention is to improve the quality of our teaching and advising by closer interaction with students. We should always regard our personal interactions with students as one of the most important aspects of our profession.

In early September we sponsored our annual kickoff BBQ and Open House for all new and returning students. Post card invitations were mailed or distributed to all new CE and ConE students. A tent with picnic facilities was set up outside Town, and a number of faculty members had demonstrations set up in the lobby or outside. The competition steel bridge and concrete canoe were also on display. Attendance for this annual even is now approaching 300. As always, the student chapters were very helpful in hosting this event.

The AGC and ASCE student chapters contact all new freshman students, and then continue throughout the academic year to encourage them to participate in chapter activities and social events. Membership in student chapters definitely enhances retention.

Faculty and staff members also hosted an open house in conjunction with Family Weekend, which has replaced Parents’ Day, on the third Saturday of September. Refreshments were available and impromptu tours were given to interested guests that stopped by.

Engineering 101 was used as a forum to help new students better understand the CE and ConE programs, to keep students informed of departmental activities, to encourage students to visit with advisors, to promote email communication with advisors, to encourage students to become involved with ASCE and AGC student chapters, and to help them better understand the registration process. The CE section did a learning style exercise to help students better understand how they individually absorb information. The last several weeks of the term the CE section was divided into small groups and given projects to help the students better “connect” with civil engineering during their first semester.

All student email addresses are maintained in a distribution list for each advisor so the advisor can contact his/her advisees at registration time and for other reasons. Advisors now also have

access to their advisee list via Access + as part of a college database that is continually updated. Such lists help improve the communication between advisor and student.

Most Civil and Construction Engineering faculty are expected to advise undergraduate students. All advisors are expected to meet personally with their advisees during the registration process and at other times according to the needs of the students. Most use email to set up appointments.

During their first couple of semesters, CE students prepare an educational objective and develop individual academic plans, i.e. an individual semester by semester program of study for completing their degree. The college has purchased software that will enable students to do this on-line in the near future. These instruments help the students better manage their academic progress and facilitate dialogue with faculty prior to registration.

Our Women and Minorities Committee sponsors periodic events for all women and minority students to support and encourage their interest in engineering. Some faculty and staff members also serve as mentors in Women in Science and Engineering (WISE) programs. During orientation, all incoming CE female students are encouraged to get involved with WISE and/or SWE (Society of Women Engineers), and to join a WISE learning community if appropriate.

Over the past year, much effort has gone into improving the web pages associated with our Civil Engineering program. On line student guides provide students easy access to program templates, program flowcharts, elective lists, standard forms, and other useful information. An on-line advising manual has been developed for our advising faculty providing ready access to useful information on co-ops and internships, help resources, honors programs, registration, study abroad, and common advising issues. An FAQ section, available to both students and faculty, is now on line and continuing to be developed. Web pages detailing scholarships available and job opportunities are also regularly updated.

A special steering committee formed by the department chair has been meeting periodically for more than a year. Consisting of the department chair, student members and faculty advisors of ASCE and Chi Epsilon, the CE Advising Committee Chair and the CE Advising Coordinator, a faculty member of the CE Integration Committee, and others as needed, the focus of the committee has been twofold: (1) identify recruitment, retention, or advising needs and student concerns that are not being met, and suggest ways to address them, and (2) try to encourage better coordination of efforts being made to address such needs to avoid duplication of effort and facilitate a comprehensive approach to meeting such needs. One result of this effort has been sponsorship by Chi Epsilon of a one evening a week help room where our students, simply on a walk-in basis, can get help on any of their CE courses from XE members, graduate students and even faculty.

The fact that, contrary to current trends in the college and university, the CE enrollment levels are the highest they have been in more than five years may be evidence that some of our recruitment and retention efforts are proving worthwhile.

Construction Engineering

AGC offered complimentary fall membership to all in-coming students to encourage them to

become active members

Engr 101 is used to orient students to campus life and to the college of engineering; to aid students in understanding their program and graduation planning in preparation for the registration process. This year ConE instituted the Cornerstone Learning Community as a complementary course with Engr 101. Engr 101 and the learning community dealt with issues of life at ISU, preparing for the career fair, the registration process, and how to study more effectively. The learning community had four industry leaders speak about the four emphases.

The ConE program made improvements in the registration process, by mailing registration packets to students (instead of handing them out in class and between classes), requesting that students bring a current resume to add to their file, and by providing a Program Management Checklist.

The ConE advisor asks three standard questions that help the advisor know the student better, that gets the student to think about what things they are doing to be a successful student, and that aid the advisor and student in identifying problems before they become detrimental to students.
Q #1: Are you working? Amount of time working influences student success academically. Working some can help them manage their time better, while working too much detracts from study time.
Q #2: Are you exercising and working out on a regular basis? Exercise is a great stress reliever and helps students sleep better. Regular and productive sleep aids the learning process in that newly learned material is transferred from short-term memory into long-term memory during certain sleep cycles.
Q #3: Are you a member of a student organization? Student membership in campus organizations meets the social needs of students, provides another outlet other than academic, and helps them learn how to balance their time among their academic demands, social and personal needs.

When students are unable to receive the type of assistance that they need for tutors (since they are not always available), the ConE advisor will request volunteer tutors from Sigma Lambda Chi, the student honorary membership.

The Academic Advisor in ConE advises students during their basis program and until they begin their professional level courses. At that time, she transfers students to a faculty advisor. Advisors all see their students at least once a semester to ensure their course load for the following semester, before registration starts. Advisors are available to students for academic concerns, professional decisions about internships and jobs, as well as personal issues that affect academic and professional decisions.

4.7 Coop and Internship

The numbers of students have continued to grow this year. Faculty participation in extension and research continue to play a vital role in seeking out new coop and intern positions in Iowa and across the nation. Our students continue to find a variety of positions in both the private and public sectors. Interest from prospective employers continues to be strong with a majority of

employers at the Engineering Career Fair offering coop or internship employment opportunities.

The results of the student and employer evaluations show that the students are being placed in positions of responsibility and being guided by persons with an interest in education. The students are also learning responsibility in another way. To receive the passing pass vs. fail grade the student must complete certain evaluation forms. Enforcement of this rule in the last year has seen the students pay more attention to the position and the evaluation forms. Employers are also spending more time with the evaluation forms and the process to identify potential long-range employees. It is interesting to note that most of the CCEE students involved in the program take on two or more different coops/internships during their four years of school and often take a permanent job with a completely different company.

Interest from employers of CCEE students as interns continues to be very high with over seventy employers attending the Fall 2004 Engineering Career Fair that were interviewing students for intern and coop job opportunities. Many employers see the experiential work experience as a very big plus when hiring a new college graduate and the students are seeing the value even more as they pursue these coop and intern opportunities. It is interesting to note that of those CE students who attend the graduation receptions held by the college, the vast majority comment to the group on their coop and intern experiences aiding them in job selection and securement. This has steadily been a growing comment in the last five years. It speaks to the College of Engineering goal of the 6 month experience for all students.

4.8 Summary of Quantitative Information (Appendix B)

As a measure of our teaching effectiveness, our students passed the national Fundamentals of Engineering exam at a 94 percent rate compared to the national average of 76 percent.

Enrollment is up a bit in civil engineering (413 to 444) and down a bit in construction engineering (325 to 316) with a slight increase in the total number (738 to 760).

After holding about constant at about 20.5 for five years, the undergraduate student enrollment per faculty FTE is now 22.5.

Female undergraduate enrollment increased to 17.8 percent with 135 women.
Minority enrollments are up to 50 (6.5 percent—up from 6.1).

The overall average teaching effectiveness of the faculty was rated by students to be 3.9 on a scale where 5 is excellent, 4 is good, and 3 is satisfactory. Rating in graduate courses was 4.1.

About 73 and 84 percent of the CE and ConE BS graduates, respectively, have employment at the time of graduation, which is down from previous years. At six months after graduation, more than 95 percent are placed.

The number of B.S. degrees was 139 this year.

About 53 percent of our entering students persist through graduation in an engineering field at

Iowa State. About 72 percent persist in some field at Iowa State.

About 74 percent of CE students and 85 percent of ConE students have at least three months of engineering experience at graduation.

4.9 Peer Comparisons (Appendix D)

Fundamentals of Engineering Examination
Passing rate of 94 percent compared to national average of 76 percent.

Enrollment and Degree Statistics (based on ASCE data)
The number of B.S. degrees ranks sixth in the nation for the 2002-2003 academic year. (not updated for 2003-2004)

Peer 11 and Top Twelve Comparisons (2004 ASEE data)
Our B.S. degree production is at 4.63 B.S./FTE, which is highest in the Peer 11 and second in the Top Twelve schools.

5.0 RESEARCH AND GRADUATE PROGRAM

5.1 Research Achievements

The faculty and staff conduct research in a variety of areas. Abstracts of the projects that were underway during this year are copied in Appendix E, which is taken from the Engineering Research Abstract List published by the College of Engineering. Graduate degree production and research funding is summarized in Appendices B and D.

We continue to strive toward national prominence and recognition of what we believe to be an excellent research program. As indicated below, we are making some progress but will need to improve our research impact by increased Ph.D. production, research funding, and national professional involvement. As other sections of this year's and last year's report indicate, we have hired some great people who are moving us in the right direction. A spirit of "can do" seems to be present in the faculty and staff. Tight budgets are requiring soft funding of several of our research efforts.

5.2 Summary of Quantitative Information (Appendix B)

Graduate enrollments are at 129 (about the same as 131) or about 4.5 students per graduate faculty.

We have a higher number and percentage of Ph.D. students that previously—51 in 2004 and 19 in 2000.

Female graduate student enrollments are at 18.6 percent, up somewhat.

International graduate student enrollments are about constant at 53 percent.

One hundred eighty nine proposals ($26,238,000) were submitted and 155 projects ($15,387,000—up from $10,898,000) received funding in 2004. (Some of the funded proposals were submitted in the previous year and the results of some of the submitted proposals are pending.)

Research expenditures were at $9,588,000, up a 3 percent.

Figures 5.1 and 5.2 show the distribution of submitted proposals and research expenditures.

Our average is about constant at $320,000 per tenure track FTE.

About 90 percent of the tenure, tenure track faculty published refereed articles.

Each member of the graduate faculty produced an average of 1.1 graduate degrees.

Figure 5.1. Proposals Funded FY2004

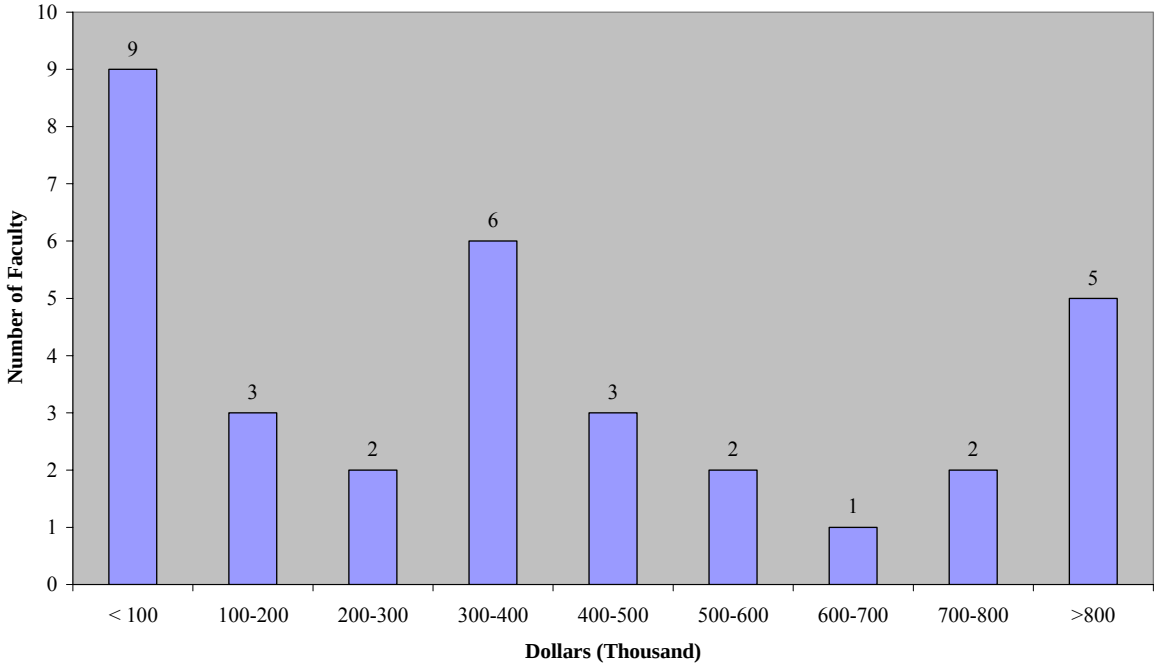
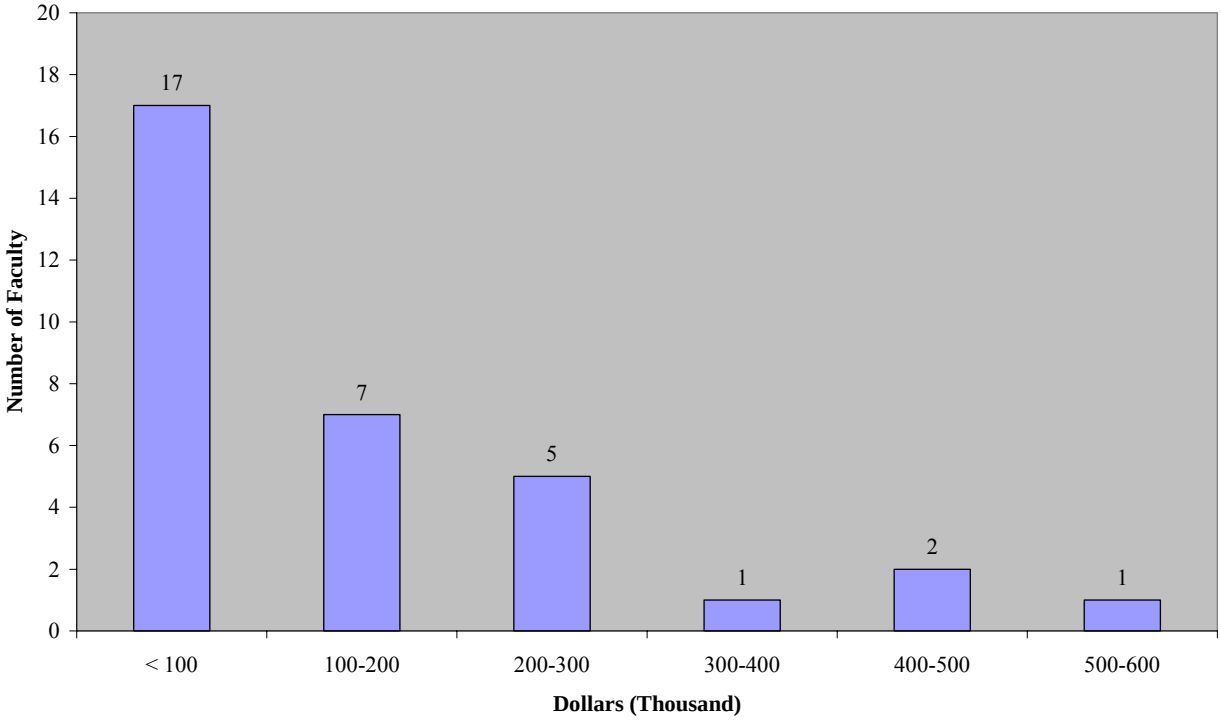


Figure 5.2. Research Expenditures FY2004



5.4 Peer Comparisons (Appendix D)

Enrollment and Degree Statistics (based on ASCE data) (Not updated)
Our M.S. and Ph.D. enrollments ranked 16 and 26, respectively, for the 2002-03 academic year. However, our graduate degree rankings are much lower – 37 and 65, respectively.

Peer 11 and Top Twelve Comparisons (2003 data)
Our graduate enrollment (4.7 students/FTE) is below the averages of both the Peer 11 and Top Twelve groups (5.5 and 5.6), as is our graduate degrees (1.0 degrees/FTE) compared to both groups (1.5 and 2.1).

Our research expenditures of $289,000/FTE are well below the average of both groups ($359,000 and $409,000).

Top 20 U.S. News and World Report
Similarly, compared to the Top 20 Graduate and Research Programs, as ranked by the *U.S. News and World Report*, we rank very high in B.S./FTE (about twice) but well below average in Ph.D./FTE (about one quarter) and research expenditures/FTE (about three quarters).

Our graduate program was ranked in the top 23 percentile of all civil engineering graduate programs. (see Highlights)

6.0 OUTREACH/SERVICE PROGRAM

6.1 Credit Courses and Non-credit Courses, Seminars, Conferences and Workshops

The actual numbers of persons attending CCE/CTRE sponsored activities remained constant in 2004 with the exception of the loss of the surveying group. Some 2,357 persons attended the CCEE Extension supported conferences and workshops.

This is down slightly from the 2,377 participants in 2002/03. The Shallow Drillers Conference, held in conjunction with the ASCE Geotechnical conference, usually draws an attendance of 250, meets in Iowa every fourth year, and was last sponsored by CCEE in spring 2002. Our continued efforts with the different transportation agencies in Iowa, the Iowa County Engineers Association, American Public Works Association, American Society of Civil Engineers, Asphalt Paving Association of Iowa and the Iowa Concrete Paving Association have provided continued opportunities for the outreach activities. We have been able to provide service to both the technical and professional staff in each of these groups.

The basic delivery method of face-face conferences and workshops continues to be the primary way of doing business for ISU. In the case of technician workshops, those meetings have been taken to the local maintenance shop for motor grader or supervisor training and to the water treatment laboratory for operator certification. Where items of general but one time interest on legislative issues become important, the ICN has successfully been used. It also plays a part in the receipt of programs from other universities for special graduate seminars. The ICN and local laboratories also provide the best use of resources for maintaining water/wastewater treatment operator training.

The CTRE portion of the work centers on the continued training of technicians associated with the transportation and construction industry. It involves training both private and public technicians in the conduct of their job descriptions in transportation. Funding is obtained from registration fees, a FHWA/LTAP grant and state support through University Extension.

During the 2003-2004 year the CTRE Extension activities centered on:

a. Safety focus in the areas of traffic studies manuals, safety circuit rider programs, flagger training and certification, work zone safety workshops and incorporation of safety into 3R programs. Some 24 articles were also produced for local use.

b. Infrastructure management focused on motor grader workshops, streets and roads conferences, snow plow roadeo, Iowa Drainage Manual, and ADA Pedestrian Facilities for Access workshops. Some 23 articles were produced for distribution on this subject.

c. Education focused on successful management workshops, math fundamentals classes, route surveying classes and ten articles on these subjects for distribution to local government personnel.

The CTRE work accounted for an additional 2,988 person days and 89 training sessions over the year.

6.2 Service to and Partnering with Industry and Communities

The partnerships between the Iowa DOT, CTRE, CCE and the APAI and ICPA that began in 1998 continue to show support for the department. The new Portland Cement Concrete Research Lab which opened in 2002 continues to grow. This year saw the introduction of the portable lab trailer is being added to allow the research to reach out to construction sites inside and outside Iowa, with the financial and material aid of the industry. The trailer and crew of four traveled to some five different states to show off new testing technologies and look for ways to improve the testing of fresh concrete to predict performance at placement. That lab is now the focal point of a series of large state and pooled fund studies. The asphalt lab had the same support to put equipment in place but has lacked the research support of the industry.

The PCC Center continues to grow and provide support to many of the Geotech Division faculty. It has successfully gained national, state and pooled fund study research in the concrete mix, materials, reinforcement and innovative pavement design areas. We are nationally recognized and have obtained special congressional funding in each year of the centers′ existence. Through the efforts of extension and the PCC Center staff funding support at the state and federal level continues to come in the amount of $1 million per year for research in concrete pavements.

The Bridge Engineering Center partnership has continued to grow this year with the aid of the Iowa DOT and the bridge construction industry in Iowa. This has involved research into bridge failures, innovative materials for design, and innovation in the construction of bridges.

This year has also seen the continued development of support from the grading industry for research in CCE. Monies and research are being developed that tie the performance of the subgrade and base layers to that of the pavements. A mobile lab trailer is being planned for this unit as a result of the outreach efforts of the department.

During 2004, Stephen Jones, P.E., Extension Civil Engineer partnered with CIRAS staff as a co-principal investigator on an Iowa Industries of the Future project focused on water and wastewater treatment issues in industry. A survey of water and wastewater programs in Iowa business and industry was completed. A final report with recommendations was prepared as a "Vision and Roadmap" document. The project results may be accessed at the CIRAS Industries of the Future site at http://www.ciras.iastate.edu/IOF/water.html .

Both the civil and construction engineering staff has been very successful in developing more industry relationships for research, coop/intern placement and departmental development support. This only works when faculty and staff have the time to provide through outreach to listen to the customer and provide the needed activities or persons for the desired solutions.

6.3 International Activities

Appendix C gives a summary of the many international activities with which our faculty and staff are involved, including faculty visits to several universities, international conferences, and international consulting.

6.4 Leadership in Professional Service

Many of our faculty members serve our profession by acting in various leadership roles (see Appendix C).

6.5 Summary of Quantitative Information (Appendices B and C)

The outreach staff has used all types of delivery methods in 2003-2004 to meet the needs of public and private civil and construction engineers. A total of 2,357 persons attended CCEE sponsored activities and 2,988 attended CTRE activities.

Financial support for CCEE Extension staff salaries is partially supported from per-capita fees assessed to each CCEE Extension event. This support is intended to cover the staff time devoted to administering the CCEE Extension programs. A cost-sharing agreement has been established between CIRAS and CCEE for administering the decreasing financial support from the University Extension budget.

Faculty members continue to be a player in the outreach activities, but research and teaching loads limit their participation in more than one activity per year. The outreach staff continues to be leaders in the areas of Water Resources, Pavement Design and Monitoring, and Local Transportation Assistance.

The total number of one-to-one outreach client interactions with industry and communities by our faculty was 3454. They participated in 184 outreach group events.

About 77 percent of the faculty members participate in extension and outreach activities.

Twelve faculty members serve in leadership roles in professional committees.

APPENDIX A: Personnel and Awards

FACULTY AND ADMINISTRATIVE ORGANIZATION – December 2004

DEPARTMENT OF CIVIL, CONSTRUCTION AND ENVIRONMENTAL ENGINEERING

Department Chair	Lowell Greimann
Department Office Manager	*Nancy Qvale*
Department Office Secretary	*Sharon Ferris*
Academic Advisor, Civil	*Ted Millen*
Academic Advisor, ConE	*Rhonda Wiley-Jones*
Fiscal Officer	*Chris Knight*
Computer Support	*Grant Stephenson*
Webmaster	*Rebekah Bovenmyer*

Construction	***Structures***	***Environmental***	***Geotechnical Materials***	***Transportation Surveying***
Jahren, C.* Cormicle, L. Jaselskis, E. Sirotiak, T. Strong, K. Walters, R.	Wipf, T.* Abendroth, R. Bolluyt, J. Fanous, F. Greimann, L. (Chair) Klaiber, F. W. Porter, M. Sritharan, S.	Ong, S.* Ellis, T. G. Gu, R. Khanal, S. Sung, S. van Leeuwen, H. Francois, B. (Res. Assoc) Jones, S. (Ext Sp) Lutz, D. (Asst Sci)	Schaefer, V.* Cable, J. Ceylan, H. Coree, B. Sharma, R. Wang, K. White, D. Davidson, D. (Lab Mec)	Souleyrette, R.* Hallmark, S. Jeyapalan, K. Jones, L. (non-division) Kannel, E. (Assoc DEO) Maze, T. Walton, M. (non-division)
Secretary	***Secretary***	***Secretary***	***Secretary***	***Secretary***
Kathy Sturtevant April Franksain	Denise Wood	Kathy Petersen	Denise Wood	Kathy Petersen

Structures Lab
Wood, D. Mgr

Analytical Services Lab
Gaunt, J. Lee, K. Schoeller, D.

Materials Analysis Lab
Amenson, J. Mgr Schlorholtz, S. Straszheim, W.

*Division Leader

Faculty and Staff Listing, Calendar 2004

Faculty

Robert E. Abendroth, P.E. (IA, WI), Associate Professor, PhD, Wisconsin, 1983, Structures, (11 years industrial experience)

James E. Bolluyt, P.E. (IA), Assistant Professor, MS, Iowa State, 1980, Structural engineering, (2 years industrial experience)

James K. Cable, P.E. (IA, IN), Associate Professor, PhD, University of Illinois, 1994, Transportation engineering, (20 years industrial experience)

Halil Ceylan, Assistant Professor, PhD, University of Illinois, Urbana-Champaign, 2002, Civil engineering geotechnical, (1 years industrial experience, 1 years international experience)

Brian J. Coree, P.E. (IN), Assistant Professor, PhD, Purdue University, 1994, Civil engineering transportation, (25 years industrial experience, 15 years international experience)

Larry W. Cormicle, P.E. (IA), Lecturer, BS, Iowa State University, 1978, Construction engineering, (24 years industrial experience)

Timothy G. Ellis, P.E. (GA, VA), Associate Professor, PhD, Clemson University, 1995, Environmental systems engineering, (6 years industrial experience, 1 year international experience)

Fouad S. Fanous, P.E. (IA, Egypt), Professor, PhD, Iowa State, 1982, Structural engineering, (4 years industrial experience, 6 years international experience)

Lowell F. Greimann, P.E. (IA, CO), Professor and Chair, PhD, Colorado, 1968, Structural engineering, (5 years industrial experience)

Ruochuan Gu, P.E. (IA), Associate Professor, PhD, Minnesota, 1991, Environmental engineering, (2 years industrial experience, 3 years international experience)

Shauna Hallmark, Assistant Professor, PhD, Georgia Tech, 1999, Transportation, (2 years industrial experience)

Charles T. Jahren, P.E. (MN), Associate Professor, PhD, Purdue, 1987, Construction engineering, (6 years industrial experience)

Edward Jaselskis, P.E. (IA), Associate Professor, PhD, Texas, 1988, Construction engineering and management, (4.25 years industrial experience, 1.1 years international experience)

Kandiah Jeyapalan, L.S. (CA), Professor, PhD, London, England, 1972, Surveying/Geodesy and Photogrammetry, (15 years industrial experience, 10 years international experience)

LaDon C. Jones, Lecturer, PhD, UCLA, 1986, Water resources (2 years industrial experience)

Edward J. Kannel, P.E. (IA), Professor, PhD, Purdue, 1972, Transportation engineering

Samir Khanal, Clinician, PhD, The Hong Kong University of Science and Technology, 2002, Environmental engineering (3.5 years international experience)

F. Wayne Klaiber, P.E. (IA), Distinguished Professor, PhD, Purdue, 1968, Structural engineering, (1.5 years industrial experience)

Thomas H. Maze, P.E. (IA), Professor, PhD, Michigan State, 1982, Transportation engineering (2 years industrial experience)

Say-Kee Ong, P.E. (OH), Associate Professor, PhD, Cornell University, 1990, Environmental engineering, (7 years industrial experience, 4 years international experience)

John M. Pitt, P.E. (IA), Associate Professor, PhD, Iowa State, 1981, Geotechnical engineering and civil engineering materials, (10 years industrial experience)

Max L. Porter, P.E. (IA), Professor, PhD, Iowa State, 1974, Structural engineering, (1 year industrial experience)

Chris R. Rehmann, Assistant Professor, PhD, Stanford, 1995, Water resources

Vernon R. Schaefer, P.E. (SD), Professor, PhD, Virginia Tech, 1987, Geotechnical engineering (3 years industrial experience)

Radhey S. Sharma, Assistant Professor, PhD, University of Oxford, 1998, Geotechnical engineering (9 years industrial experience, 13 years international experience)

Todd L. Sirotiak, P.E. (IA), Lecturer, MS, Iowa State, 1997, Construction engineering (20 years industrial experience)

Reginald Souleyrette II, P.E. (IA), Professor, PhD, Berkeley, 1989, Transportation engineering (1 year industrial experience)

Sivalingam Sritharan, Assistant Professor, PhD, UC San Diego, 1998, Structures (4 years industrial research experience)

Kelly C. Strong, Associate Professor, PhD, University of Colorado, 1992, Construction Engineering (7 years industrial experience)

Shihwu Sung, P.E. (IA, WI), Associate Professor, PhD, Iowa State, 1994, Environmental engineering, (6 years industrial experience, 1 year international experience)

Johannes (Hans) van Leeuwen, CPEng (Australia), PE (IA, S. Africa), Professor, DEng, Pretoria, S. Africa, 1988, Environmental engineering (25 years international experience, including 10 years industrial experience)

Russell C. Walters, P.E. (IL), Assistant Professor, PhD, University of Florida, 1993, Construction engineering (7 years industrial experience)

Marlee A. Walton, P.E. (IA), LSI (IA), Lecturer, MS, Iowa State, 1991, Integrated curriculum (15 years industrial experience)

Kejin Wang, P.E. (IL), Assistant Professor, PhD, University of California, Berkeley, 1994, Structural materials, concrete (7 years industrial experience, 6 years international experience)

David White, E.I.T. (MO), Assistant Professor, PhD, Iowa State, 2000, Geotechnical/Materials engineering (1 year industrial experience)

Terry J. Wipf, P.E. (NE), Professor, PhD, Nebraska, 1983, Structural engineering, (3.5 years industrial experience)

Courtesy Appointments

Johannes (Hans) van Leeuwen, courtesy appointment in Agricultural and Biosystems Engr

Partha Sakar, Associate Professor of Aerospace Engineering and Engineering Mechanics, PhD, John Hopkins University, 1992, Wind Engineering

Temporary Faculty

Kevin R. Behling, Lecturer, MS, Iowa State, 1993, Construction engineering

Steve Bell, Lecturer, MS, Texas A&M, 1987, Construction management

David A. Ferree, Instructor, JD, University of Iowa, 1978

Stuart S. Nielsen, Instructor, BS, Iowa State, 1994, Civil engineering

Adjunct Faculty

Jerry Amenson, Lecturer/Manager, AA, 1968, Materials Analysis Research Laboratory

Steve Andrle, Adjunct Assistant Professor, MA, University of Iowa, 1975, Urban & Regional Planning

E. Thomas Cackler, Lecturer, BS, Iowa State, Civil Engineering

Maohong Fan, Adjunct Assistant Professor, PhD, Iowa State, 2000, Mechanical

James A. Gaunt, Lecturer/Manager, MS, Iowa State, 1971, Analytical Services Laboratory/EEWR Laboratory

James D. Grove, Lecturer, MS, Iowa State, 1978, Transportation

Neal R. Hawkins, Lecturer, MS, Iowa State, 1990, Transportation

Brent M. Phares, Adjunct Assistant Professor, PhD, Iowa State, 1998, Structures

David Plazak, Adjunct Assistant Professor/Scientist, MA, University of Iowa, 1979, Urban and Regional Planning

Scott M. Schlorholtz, Associate Scientist/Adjunct Assistant Professor, PhD, Iowa State, 1990, Materials Analysis Research Laboratory

Omar G. Smadi, Adjunct Assistant Professor, PhD, Iowa State, 2000, Transportation

Duane E. Smith, Adjunct Assistant Professor, MS, Iowa State, 1980, Transportation

Collaborators

Johanshir Golchin, Assistant Professor, Environmental Engineer, PhD, Iowa State, 1982, Civil engineering/Water resources

Rao Surampalli, P.E. (IA), Professor, PhD, Iowa State, 1985, Environmental engineering

Emeritus/Retired Faculty

Mardith A. Baenziger, Associate Professor, Structural engineering

E. Robert Baumann, Distinguished Professor Emeritus, Environmental engineering and Water Resources, 1953-1991

Kenneth L. Bergeson, Professor Emeritus, Civil engineering materials, 1988-2001

Kenneth A. Brewer, Professor Emeritus, Transportation engineering, 1969-2001

Robert L. Carstens, Professor Emeritus, Transportation Engineering, 1973-1986

John L. Cleasby, P.E., Distinguished Professor Emeritus, Environmental engineering, 1954-1993

Gerald W. Chase, Associate Professor Emeritus, Construction engineering and management, 1977-1997

Kenneth F. Dunker, P.E. and Registered Architect, Associate Professor, Structural engineering, 1979-1999

Carl E. Ekberg, Jr., Professor Emeritus, Head of Civil Engineering, Structural engineering, 1960-1988

Richard L. Handy, Distinguished Professor Emeritus, Geotechnical engineering, 1956-1991

Rolland Hardy, Professor Emeritus, Surveying engineering, 1966-1992

Thomas C. Jellinger, Professor Emeritus, Construction Engineering, 1960-1981

David Kao, Dean and Professor Emeritus, Water Resources, 1988-1999

Dah-Yinn Lee, Professor Emeritus, Geotechnical engineering, 1965-1998

Robert Lohnes, University Professor, Geotechnical engineering, 1965-2002

Lane H. Mashaw, Professor Emeritus, Freshman engineering, Civil engineering, 1974-1987

Cletus R. Mercier, P.E., Associate Professor Emeritus, Civil engineering, 1968-1999

Jack L. Mickle, Professor Emeritus, Geotechnical engineering, 1960-1992

Richard Montag, Associate Professor, Surveying, 1961-1988

Paul E. Morgan, Professor Emeritus, Associate Dean of Engineering, Sanitary engineering, 1953-1987

Larry L. Northup, Professor, Aerospace/mechanical engineering, 1963-2003

Charles S. Oulman, P.E., Professor, Sanitary engineering, 1956-1999

John M. Pitt, P.E., Associate Professor, 1978-2004

Wallace W. Sanders, Professor Emeritus, Structural engineering, 1964-1998

John B. Sheeler, Associate Professor Emeritus, Geotechnical engineering, 1951-1988

Donald Wall, PE, LS, Adjunct Assistant Professor, Surveying/engineering extension, 1981-1999

Ira Ward, Associate Professor Emeritus, Construction engineering, 1970-1986

Professional and Scientific Staff

Jerry Amenson, Adjunct Instructor/Manager, AA, 1968, Materials Analysis Research Laboratory

Rebekah S. Bovenmyer, Communications Specialist II, BA, Iowa State, 2003, English

Donald T. Davidson, Leb Mech Tech, Geotechnical lab supervisor

Brent C. Francois, Research Associate, BS, Iowa State, 2003, Water Resources

James A. Gaunt, Adjunct Instructor/Manager, MS, Iowa State, 1971, Analytical Services Laboratory/EEWR Laboratory

Stephen E. Jones, P.E. (IA), Extension Civil Engineer, MS, Iowa State, 1995, Environmental engineering (6 yrs industrial experience)

Christine K. Knight, Administrative Specialist/Fiscal Officer

Kendra Lee, Assistant Scientist, BS, Southeastern Oklahoma State, 1996, Biology

Donna Lutz, Research Associate, MS, Iowa State, 1993, Water Resources

Theodore W. Millen, Academic Advisor I, B.S., Iowa State, 1968, Electrical Engineering

Scott M. Schlorholtz, Associate Scientist/Adjunct Assistant Professor, PhD, Iowa State, 1990, Materials Analysis Research Laboratory

David G. Schoeller, Assistant Scientist, BS, Iowa State, 1985, Analytical Services Laboratory

Greg A. Stenback, Associate Scientist, PhD, Iowa State, 1996, Geotechnical engineering

Grant Stephenson, Computer Support Specialist, BA, Cornell College, 2001

Warren E. Straszheim, Associate Scientist, PhD, Iowa State, 1986, Materials analysis Research Laboratory

Rhonda Wiley-Jones, Academic Advisor, MEd, University of Missouri, Columbia, 1980, Higher and adult education

Douglas L. Wood, Manager, MS, Iowa State, 1990, Instruction Laboratory

Secretarial/Clerical Staff

Marva Banks, Secretary II, Main Office

April Franksain, Secretary II, Construction

Sharon Ferris, Secretary II, Department Chair/Main Office

Kathy Petersen, Secretary II, Transportation, Environmental

Nancy Qvale, Office Coordinator, Assistant to DEO

Kathy Sturtevant, Secretary II, Construction

Denise Wood, Secretary II, Geotechnical/Materials, Structures

Changes in Faculty Status

Promotions, Retirements, Resignations, Faculty Leaves, and New Faculty
Calendar Year 2004

New Faculty

Chris Rehmann

Retirements

James E. Bolluyt (phased)
John Pitt

Resignations

None

Faculty on Leave

Mardith Baenziger (medical leave)

New Emeritus Faculty

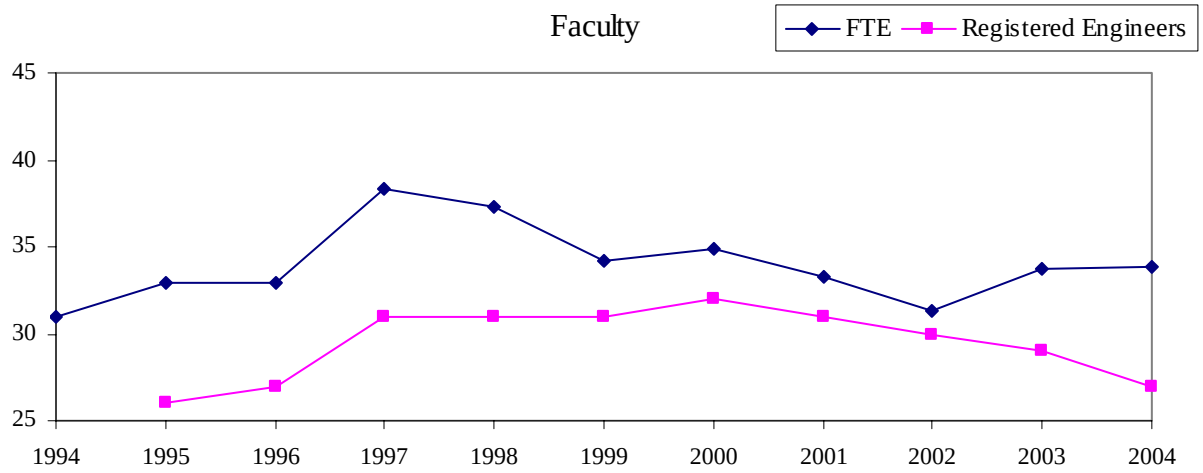
John Pitt

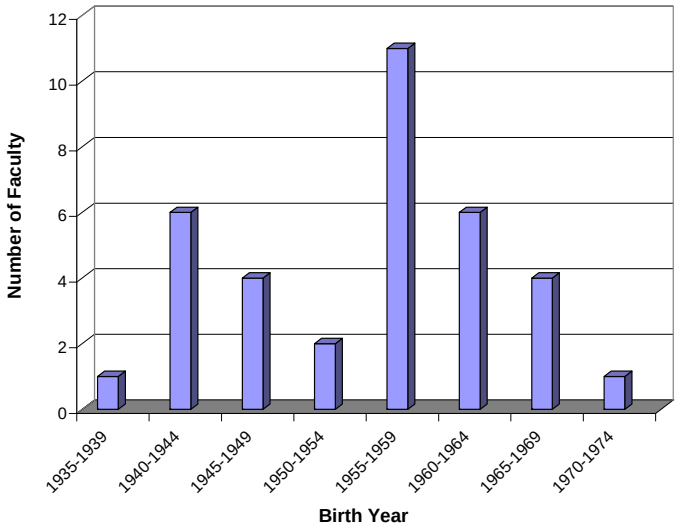
Visiting Faculty

Augusto Canales, Monterry Tech, Mexico
Eyyup Debik, Yildiz Technical University, Turkey
Kang, Seon-Hong, Seoul University, Korea
Jong Won Park, Hong Ik University, Korea

FACULTY

Year	Budgeted FTE	Head Count	Women	Underrep Minority	# w/1yr Experience	# Registered Engineers	# w/3 mos. Intrn'l Exp	# Professional Leadership
1990	33.66	31	4	0				
1991	33.41	33	2	0				
1992	32.42	30	2	0				
1993	30.42	30	2	0				
1994	30.92	34	2	0				
1995	32.88	34	2	0	26	26	11	16
1996	32.88	34	2	0	26	27	11	16
1997	38.30	40	2	0	32	31	13	17
1998	37.30	38	1	0	28	31	13	14
1999	34.19	35	1	0	30	31	10	16
2000	34.85	36	4	0	33	32	12	10
2001	33.25	34	5	0	31	31	12	21
2002	31.31	33	4	0	31	30	11	22
2003	33.73	39	4	0	33	29	11	31
2004	33.80	35	3	0	31	27	12	18





Faculty Awards, Calendar Year 2004

FACULTY	AWARD	FROM
Bell	2004 Engineering Leadership Award	College of Engineering
Bolluyt	2004-05 Chi Epsilon Excellence in Teaching Award	North Central District, Chi Epsilon
Brewer (emeritus faculty)	Iowa Section Award	Iowa Section ASCE
Cable	2004 Engineering Leadership Award	College of Engineering
Ceylan	Best Paper Award for Novel Smart Engineering System Design	Artificial Neural Networks in Engineering
Cormicle	Outstanding Faculty Member	Engineering Student Council Leadership Award
Cormicle	Faculty Coach, 1st Place, Region IV Competition, Commercial Division	Associated Schools of Construction
Cormicle	Faculty Coach, 1st Place, Region IV Competition, Design/Build Team	Associated Schools of Construction
Cormicle	Faculty Coach, 1st Place, Region IV Competition, Heavy Highway Team	Associated Schools of Construction
Greimann	Superior Service to Alumni	ISU Alumni Association
Jones	Outstanding Professor in Civil Engineering	ISU Students
Ong	Outstanding Achievement in Teaching	ISU Foundation
Porter	Faculty advisor, 2nd place National Competition for Capstone Design Teams	EWRI, ASCE
Rehmann	Best Paper Award for 2003, Center of Aquatic Ecology	Illinois Natural History Survey, UIUC (2004)
Rehmann	UIUC "Incomplete List of Teachers Ranked as Excellent"	Univ. of Illinois, Urbana-Champaign, 2004
Schaefer	James M. Hoover Chair in Geotechnical Engineering	CCEE
Sharma	2004 Telford Medal	Highest award from the Institution of Civil Engineers, London
Souleyrette	Gerald & Audrey Olson Professorship	CCEE
Sung	Fulbright Scholarship recipient of 2004/2005 program	Fulbright Foundation
Walton	Outstanding Faculty	Interfraternity Council

Walton	Joseph and Elizabeth Anderlik Faculty Award for Excellence in Undergraduate Teaching	CCEE
White	Charles W. Schafer Faculty Award for Excellence in Teaching, Research and Service	CCEE

Student Awards, Calendar Year 2004

STUDENT	AWARD
Aaleti, Sriram	Co-Winner, 3rd Place in Zone 3, PCI Big Beam Contest
AGC Student Chapter	2nd Place in National Student Chapter of the Year Competition, Associated General Contractors of America
Bayleyegn, Yared	Co-Winner, 3rd Place in Zone 3, PCI Big Beam Contest
Bobzien, Ben	2nd place National Competition for Capstone Design Teams, EWRI of ASCE
Borchers, Eric	Shirrey Award
Borchers, Eric	Outstanding Senior of the Year, Iowa Section ASCE
Cornelius, Scott	1st Place, Associated Schools of Construction Region IV Competition, Heavy Highway Team
Crubaugh, Jamie	1st Place, Associated Schools of Construction Region IV Competition, Heavy Highway Team
Degen, Brian	Co-Winner, 3rd Place in Zone 3, PCI Big Beam Contest
Doornink, Justin	2004-2005 Midwest Transportation Consortium Scholar of the Year
Elkins, Jeff	1st Place, Associated Schools of Construction Region IV Competition, Design/Build Team
Fanous, Annie	Shirrey Award
Grubb, Andrew	1st Place, Associated Schools of Construction Region IV Competition, Heavy Highway Team
Halverson, Clinton	Hoover Scholarship 2004
Halvorson, Julie	1st Place, Associated Schools of Construction Region IV Competition, Design/Build Team, Team Captain
Harris, Joe	1st Place, Associated Schools of Construction Region IV Competition, Design/Build Team

STUDENT	AWARD
Isebrands, Hillary	Dwight D. Eisenhower Graduate Research Fellowship
Isebrands, Hillary	Eno Leadership Development Conference Fellow
Jackson, Ryan	NSF GK-12 Fellowship
Jestrab, Eric	1st Place, Associated Schools of Construction Region IV Competition, Heavy Highway Team
Jha, Manoj K.	ISU Research Excellence Award
Jha, Manoj K.	All But Dissertation Award, ISU Graduate College
Klemme, Brian	1st Place, Associated Schools of Construction Region IV Competition, Commercial Division
Kolz, Angela	2004 Water Environment Federation Technical Conference (WEFTEC), New Orleans, 2nd place for Poster Presentation
Kurth, Jim	1st Place, Associated Schools of Construction Region IV Competition, Heavy Highway Team
Miltenberger, Josh	1st Place, Associated Schools of Construction Region IV Competition, Commercial Division, Team Captain
Nickel, Justin	2nd place National Competition for Capstone Design Teams, EWRI of ASCE
Overgaard, Nels	2004 Engineering Leadership Award, Outstsanding Member, AGC
Overgaard, Nels	1st Place, Associated Schools of Construction Region IV Competition, Heavy Highway Team, Team Captain
Peterson, Leslie	Design Build of America
Roecker, Seth	1st Place, Associated Schools of Construction Region IV Competition, Commercial Division
Rotta, Andrew	1st Place, Associated Schools of Construction Region IV Competition, Design/Build Team
Sandvig, Bryan	1st Place, Associated Schools of Construction Region IV Competition, Design/Build Team
Schaefer, Scott	2nd place National Competition for Capstone Design Teams, EWRI of ASCE
Schafer, Cliff	1st Place, Associated Schools of Construction Region IV Competition, Commercial Division
Schmidt, Kirt	1st Place, Associated Schools of Construction Region IV Competition, Commercial Division
Shi, Yonghui	Special Environmental Engineering Research Award

STUDENT	AWARD
Steel Bridge Team	2nd place speed and efficiency; 8th place overall, ASCE national competition
Thompson, Mark	Midwest Transportation Consortium Best Paper Award
Thrap, Josh	1st Place, Associated Schools of Construction Region IV Competition, Commercial Division
Waugh, Jon	Co-Winner, 3rd Place in Zone 3, PCI Big Beam Contest
Wessels, Brian	2004 Engineering Leadership Award, President, AGC

Staff Awards, Calendar Year 2004

STAFF	AWARD
Bovenmeyer, Rebekah	Award of Merit, CCEE Website, Society for Technical Communication Chicago regional competition
Lutz, Donna	Professional and Scientific Excellence Award

Alumni Awards, Calendar Year 2004

ALUMNUS	AWARD
Hurd, M.K. (Mary), (BS 1947)	Marston Medal, ISU Alumni Association

Student Scholarships, Academic Year 2004-05

STUDENT		SCHOLARSHIP
Abbott	Danielle	College of Engineering
Akers	Toshia	The Frank Kerekes Memorial Scholarship Fund
Albertson	Daryl	Iowa County Engineers Civil Engineering Award
Albertson	Daryl	Engineering College Scholarship Fund
Alleman	Anthony	The Oscar L. Bock Scholarship Fund in Engineering
Allen	Christine	The Joseph & Elizabeth Anderlik Scholarship Fund
Andera	Nicholas	National Electrical Contractors Association
Andera	Nicholas	The Craig Thompson, Sr. (TEC Corp Scholarship Fund)
Audino	David	Master Builders of Iowa

STUDENT		SCHOLARSHIP
Audino	David	National Association for Women in Construction – DM Chapter
Bangasser	Peter	James B. Cecil Memorial Scholarship
Barrett	Trevor	College of Engineering Scholarship Fund
Bauer	Christopher	Iowa Concrete Paving Association
Bauer	Matthew	ASCE
Beatty	Alyson	Engel Scholarship Endowment in Engineering
Behling	Kevin	AGC of America
Bell	Nicole	College of Engineering
Biver	Stephen	Engineer's Week
Blume	Jodie	Harry Oakley Price Scholarship Fund
Boekholder	Brian	Seward, Ratcliff & Galloway
Boettcher	Michael	Woodruff Construction
Borchers	Eric	CCEE National Merit Scholarship Account
Borgerding	Scott	CCEE
Brace	Aaron	Mechanical Contractors Association of Iowa
Brace	Aaron	Sheet Metal Contractors Association of Iowa
Branch	Eli	The Laurence T. & Jessie Davidson Gaylord Scholarship Fund
Brekken	Jason	Seward, Ratcliff & Galloway
Brodersen	Stephanie	The Roderick Seward, Flossie Ratcliffe & Helen M. Galloway Scholarship Fund
Brostrom	Kristin	H. S. Ostlin Scholarship Fund in Civil Engineering
Bruton	Tom	CCEE National Merit Scholarship Account
Burgod	Nathan	ASPE – Quad Cities Chapter #71
Caldwell	Iris	The John R. & Eloise M. Wright Endowed Engineering Scholarship Fund
Cheek	Marshall	The Nelson Brothers Scholarship Fund
Chooi	Wai	The Civil, Construction & Environmental Engineering Scholarship Fund
Clausen	Lucas	Engineer's Week
Clemen	Jason	The Herbert C. James Memorial Scholarship Fund
Colman	Kassi	Mary Thompson Fund
Corcoran	Richard	Iowa County Engineers Civil Engineering Award
Corcoran	Richard	Engineering College Scholarship Fund
Cornelius	Scott	AGC of America
Cornelius	Scott	AGC of Iowa Foundation

STUDENT		SCHOLARSHIP
Cornelius	Scott	Carl Nelson
Cornelius	Scott	Iowa Concrete Paving Association
Cowles	Eric	AGC of Iowa Foundation
Cowles	Eric	Ronald Kenyon
Cowles	Eric	Martin Marietta
Crubaugh	Jamie	AGC of America
Crubaugh	Jamie	AGC of Iowa Foundation
Crubaugh	Jamie	Robert & Sheri Homer
Davis	Deanna	The Civil, Construction & Environmental Engineering Scholarship Fund
DeBolt	Jerad	Mechanical Contractors Association of Iowa
Dees	Ben	Margherita Tarr Estate Engineering Scholarship
Diercksen	Lisa	The Ronald D. Kenyon Scholarship Fund
Dittus	Kenneth	Iowa Ready Mix Concrete Association
Dix	Ross	Master Builders of Iowa
Dobling	Mary	Engineer's Week
Dobling	Mary	Iowa County Engineers Civil Engineering Award
Dobling	Mary	Engineering College Scholarship Fund
Dole	Jeffrey	H. S. Ostlin Scholarship Fund in Civil Engineering
Dole	Jeffrey	Darlene & Melvin Larsen Engineering Scholarship Fund
Ebel	Lee	CCEE
Elijah	Kelli	The Asphalt Paving Association of Iowa (Fred Carlson)
Elkins	Jeffrey	Ronald Deihl Memorial
Fanous	Ann-Marie	The Joseph & Elizabeth Anderlik Scholarship Fund
Godbout	Nicole	Charles W. Schafer
Granquist	Brian	Paul Foster Barnard Memorial Scholarship
Granquist	Brian	Engel Scholarship Endowment in Engineering
Granquist	Brian	ASCE
Gray	Andrew	Engineer's Week
Greenlee	Jonathan	Engineer's Week
Grubb	Andrew	AGC of Iowa Foundation
Grubb	Andrew	Ziegler Engineering
Guggisberg	Angela	Klinger Award
Haaland	Ryan	AGC of America
Hackman	Matthew	The C. L. Hulsbos Scholarship Fund in Engineering
Halvorson	Julie	AGC of America

STUDENT		SCHOLARSHIP
Halvorson	Julie	Construction Achievement
Halvorson	Julie	Orville Crowley
Halvorson	Julie	National Association for Women in Construction – DM Chapter
Halvorson	Julie	RJM Construction Education Fund
Harle	Mark	Engineer's Week
Harris	Joseph	Ken Lewis Education Fund
Hawkins	Alison	The College of Engineering Scholarship Fund
Hinnah	Melanie	The Barbara Ann Highland Herum Environmental Engineering Scholarship Fund
Hinnah	Melanie	Don French Memorial Scholarship Fund
Holtz	Mitchell	The Asphalt Paving Association of Iowa (Robert & Sheri Horner)
Hopkins	Elara	Margherita Tarr Estate Engineering Scholarship
Hotovec	Chad	Mechanical Contractors Association of Iowa
Hotovec	Chad	Sheet Metal Contractors Association of Iowa
Jestrab	Eric	AGC of America
Jestrab	Eric	AGC of Iowa Foundation
Jestrab	Eric	Ronald Kenyon
Johnsen	Sara	College of Engineering
Jones	Traver	The J. Wade Switzer Scholarship Fund
Junge	Jason	Margherita Tarr Estate Engineering Scholarship
Kliethermes	Rachel	The College of Engineering Scholarship Fund
Kliethermes	Rachel	Donald D. Kaser Memorial Award
Kliethermes	Rachel	Carl and Dorothy Ekberg Structural Engineering Scholarship Fund
Knox	Jamie	Mechanical Contractors Association of Iowa
Kozelka	Kurt	H. Stuart Kuyper
Kresser	Mark	Engineer's Week
Kuhn	Lisa	The Oscar L. Bock Scholarship Fund in Engineering
Kurth	James	AGC of America
Kurth	James	Ahrold & Fay, Inc.
Kurth	James	E-Week
Lack	Andrew	The Civil, Construction & Environmental Engineering Scholarship Fund
Larkin	Arica	College of Engineering
Lind	Kevin	Centex/Rodgers

STUDENT		SCHOLARSHIP
Lind	Kevin	E-Week
Lippens	Danielle	College of Engineering
Lovin	Grant	Phillip Jennings Memorial
Maher	Julie	The Paul B. Reis Memorial Scholarship Fund
Marruffo	Amanda	College of Engineering
Massa	Josh	Margherita Tarr Estate Engineering Scholarship
McAllister	Kelly	Margherita Tarr Estate Engineering Scholarship
Mercuris	Peter	Whitfield & Eddy
Merical	Jennifer	College of Engineering
Miller	Adam	Charles W. Schafer
Miltenberger	Joshua	E-Week
Mittag	Nathan	E-Week
Monterrubio	Melinda	College of Engineering
Montz	Craig	E-Week
Montz	Craig	Master Builders of Iowa
Morud	Jennifer	Margherita Tarr Estate Engineering Scholarship
Mueller	Kyle	E-Week
Murray	Tyrel	Mechanical Contractors Association of Iowa
Murray	Tyrel	Sheet Metal Contractors Association of Iowa
Nelson	Rebekkah	The Barbara Ann Highland Herum Environmental Engineering Scholarship Fund
Nowak	Jenna	Charles W. Schafer
Olson	Katie	Charles W. Schafer
Opheim	Joshua	The Joseph & Elizabeth Anderlik Scholarship Fund
Overgaard	Nels	AGC of America
Overgaard	Nels	AGC of Iowa Foundation
Overgaard	Nels	Dale Dickinson
Overgaard	Nels	E-Week
Petersen	Andrew	Mass Electric Construction Company
Petersen	Eric	Robert L. Carstens
Peterson	Joel	The Harris F. Seidel Scholarship Fund
Pifkin	Matthew	Patricia Werner Merten Memorial
Plagge	Lucas	Robert L. Carstens
Potthoff	Rachel	College of Engineering
Pulczinski	Gerold	Iowa Concrete Paving Association
Rahe	David	E-Week

STUDENT		SCHOLARSHIP
Rhodes	Clinton	AGC of Iowa Foundation
Riesberg	Gina	Centex/Rodgers
Riesberg	Gina	Scott Kinkade Memorial
Riesberg	Gina	Turner Construction Co.
Riesberg	Gina	Iowa County Engineers Civil Engineering Award
Riesberg	Gina	Engineering College Scholarship Fund
Roecker	Seth	Weitz Golf, Florida
Ross	Nathan	Charles W. Schafer
Rotta	Andrew	E-Week
Rotta	Andrew	The College of Engineering Scholarship Fund
Schaapveld	Gregory	Engineer's Week
Schoch	Bradley	The College of Engineering Scholarship Fund
Schroeder	Michael	College of Engineering
Schroeher	Mark	The Claude R. & Christina A. Summers Memorial Scholarship Fund
Schumacher	Tracey	Charles W. Schafer
Schuster	Frederick	College of Engineering
Schwaller	Ashley	The Almon H. Fuller Scholarship Fund
Scott	Eric	The Asphalt Paving Association of Iowa (Fred Carlson)
Scully	Anthony	AGC of America
Scully	Anthony	Beavers
Scully	Anthony	National Association for Women in Construction – KC Chapter
Shay	Emily	The College of Engineering Scholarship Fund
Shearer	Brandon	College of Engineering
Spain	Jesse	Mass Electric Construction Company
Spielbauer	Stephanie	College of Engineering
Stroda	Jessica	Margherita Tarr Estate Engineering Scholarship
Sturm	Scott	Margherita Tarr Estate Engineering Scholarship
Sullivan	Mark	Weis Builders
Swanson	Eric	The College of Engineering Scholarship Fund
Tarbell	Cody	The Walter N. Handy Memorial Scholarship Fund
Thompson	Jenna	College of Engineering
Thrap	Joshua	Concrete Pipe Association
Thrap	Joshua	Raymond & Evelyn McIlvain
Thrap	Joshua	The Weitz Company, Arizona

STUDENT		SCHOLARSHIP
Vande Voort	Thomas	Margherita Tarr Estate Engineering Scholarship
Vandervort	Glen	The Fred K. Beatty Memorial Scholarship Fund
Vonnahme	John	James Cecil Memorial
Ward	Danny	Seward, Ratcliff & Galloway
Weber	Cody	Mass Electric Construction Company
Weis	Shane	AGC of America
Wessels	Brian	Conlon Construction Co.
Wessels	Brian	E-Week
Wessels	Brian	RC Ringwald
Wetmore	Thomas	Mass Electric Construction Company
White	Chad	Mortenson
Wickering	Gary	Kenneth Nimmo Memorial
Will	Ben	Robert L. Carstens
Will	Ben	Iowa County Engineers Civil Engineering Award
Will	Ben	Engineering College Scholarship Fund
Williams	Jera	Iowa Concrete Paving Association
Wojtysiak	Crystal	Deere & Company
Woline	Benjamin	Engineer's Week
Wright	Ariana	JE Dunn Construction Co
Wright	Ariana	Master Builders of Iowa
Wright	Ariana	National Association for Women in Construction – DM Chapter
Wright	Ariana	National Association for Women in Construction – Kansas City Chapter
Zikra	Alex	JE Dunn Construction Co

May 19, 2004

CIVIL, CONSTRUCTION AND ENVIRONMENTAL ENGINEERING COMMITTEE ASSIGNMENTS---2004-05

ADVISING & STUDENT CONCERNS: Ong (chair) (01-02), Abendroth (01-02), student*; **CE Awards:** Ellis (99-01) (ASCE), White (02-03) (XE); **ConE Awards**: Cormicle (AGC), Jaselskis (SLC), Strong (DBIA), Walters (MCAA & NECA)

WOMEN & MINORITIES: Walters (chair) (02-03), Sritharan (02-03), Wang (03-04), Wiley-Jones (04-05), student 1*, student 2*, student 3*

INTERNATIONAL COMMITTEE: Jaselskis (chair), Klaiber, van Leeuwen, Wipf

OUR TOWN: Greimann (chair), Klaiber, Porter, Jahren, Cable, Ferris, Wipf, White, Maze, Schaefer

ALUMNI & PUBLIC RELATIONS: Jahren (chair) (00-01), Porter (00-01), Klaiber (00-01), Sung (02-03), Maze (03-04), Schaefer (04-05)

OUTREACH: Cable (Chair), S. Jones, Andrle, D. Smith

CIVIL PROGRAM

CURRICULUM: Ellis (chair) (03-04), Wang (02-03), Abendroth (01-02), Souleyrette (01-02), Sirotiak (ConE), student 1* (voting), student 2* (non-voting)

INTEGRATION: Walton (chair) (01-02), L. Jones (Fr/Soph) (00-01), Ceylan (03-04), Schaefer (03-04), Porter (03-04), Wipf (02-03), van Leeuwen (04-05), Bolluyt, Kannel

PLANNING & ASSESSMENT: Kannel (chair), White (02-03), Gu (01-02), Hallmark (01-02), Fanous (02-03)

INTEGRATION, PLANNING & ASSESSMENT, and CURRICULUM STEERING: Greimann (chair), Kannel (Planning), Walton (Integration), Ellis (Curriculum)

HONORS: Ellis (98-99); **COOP:** Cable (99-00)

CONSTRUCTION PROGRAM

CURRICULUM: Sirotiak (chair) (03-04), Jahren (01-02), Cormicle (03-04), Souleyrette (CE), student 1* (03-04), student 2* (03-04)

HONORS: Jaselskis (00-01); **COOP**: Cormicle (04-05)

SPACE & EQUIPMENT: Wood (Doug) (chair) (02-03), Sung (02-03), Stephenson (03-04), Strong (04-05)

SAFETY: Gaunt (Chair), Wood, Davidson, Schlorholtz, Ceylan, White, Kannel

COMPUTER: Sritharan (chair) (00-01), Gu (03-04), Stephenson (03-04), Sharma (04-05), student 1* (CE), student 2* (ConE), student 3* (graduate)

SPECIAL EVENTS: Schaefer (chair) (04-05), Klaiber (04-05), Hallmark (01-02)

FACULTY SENATE: Coree (at-large) (03-04), van Leeuwen (02-03)

FACULTY COUNCIL: Porter (chair) (02-03, 3 yr), Maze (03-04), Klaiber (04-05), Jaselskis (03-04), Gu (04-05)

ASSOCIATE DEO: Kannel (CE), **ASSISTANT DEO:** Jahren (ConE),

ADMINISTRATIVE COUNCIL: Schaefer (03-04) (Geo/Mat), Jahren (04-05) (ConE), Ong (03-04) (Env), Wipf (02-03) (Str), Souleyrette (02-03) (Trans)

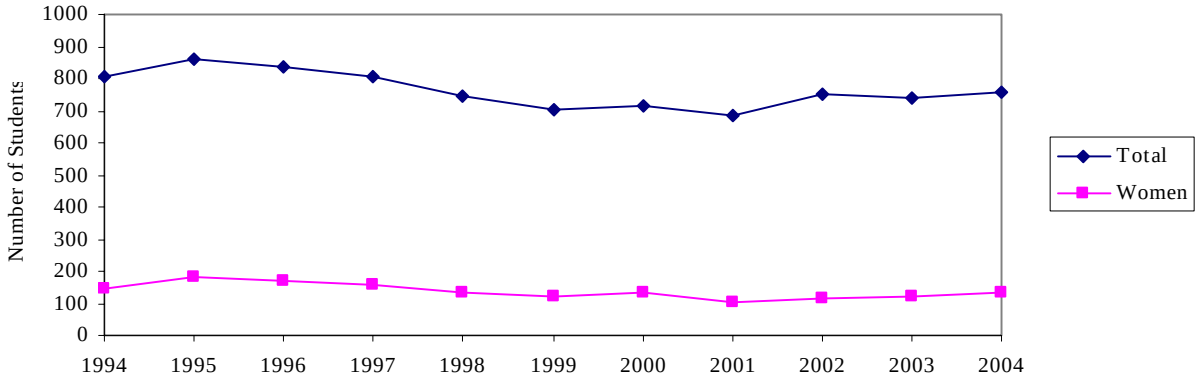
[Numbers in parenthesis indicate year of appointment. "*" Refers to positions to be filled or awaiting response]

APPENDIX B: Numerical Data

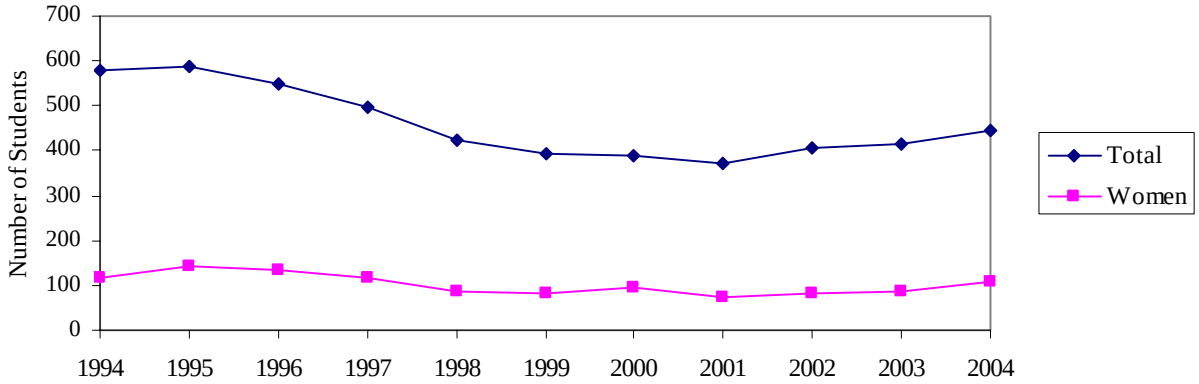
PLOTS

TABLES

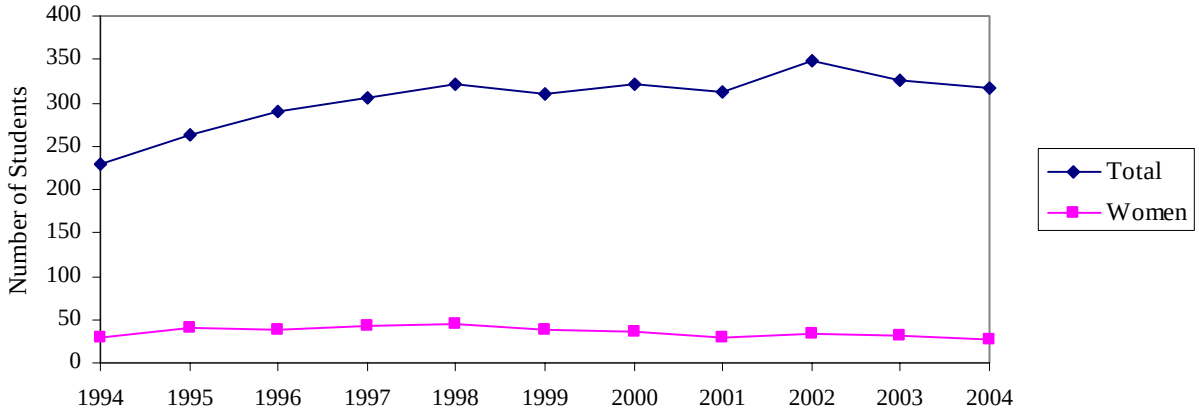
BS Enrollment



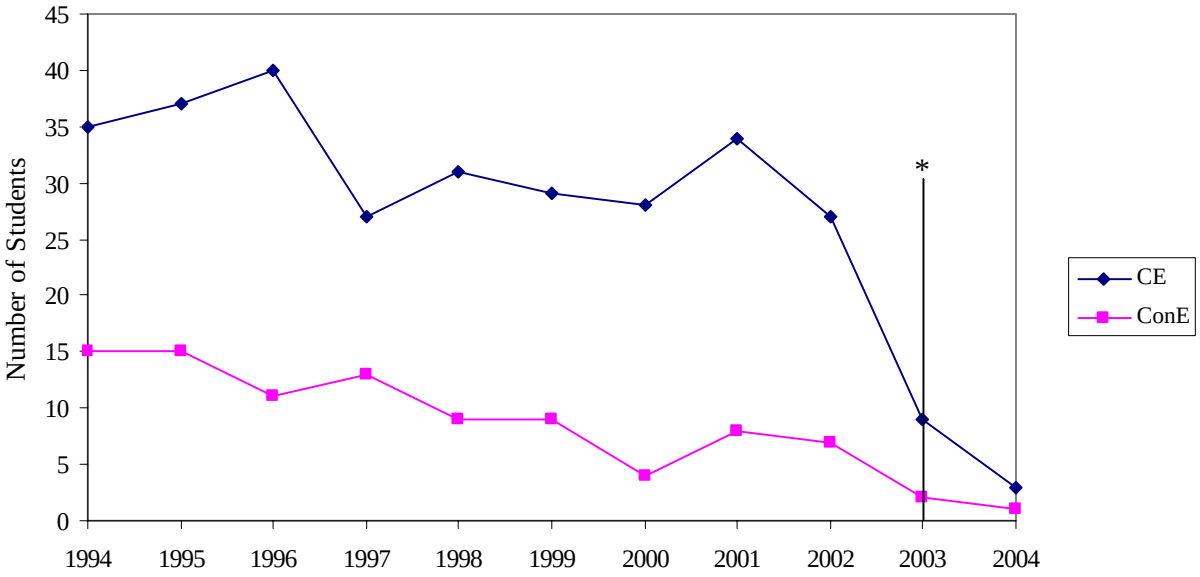
BS Enrollment (CE)



BS Enrollment (ConE)

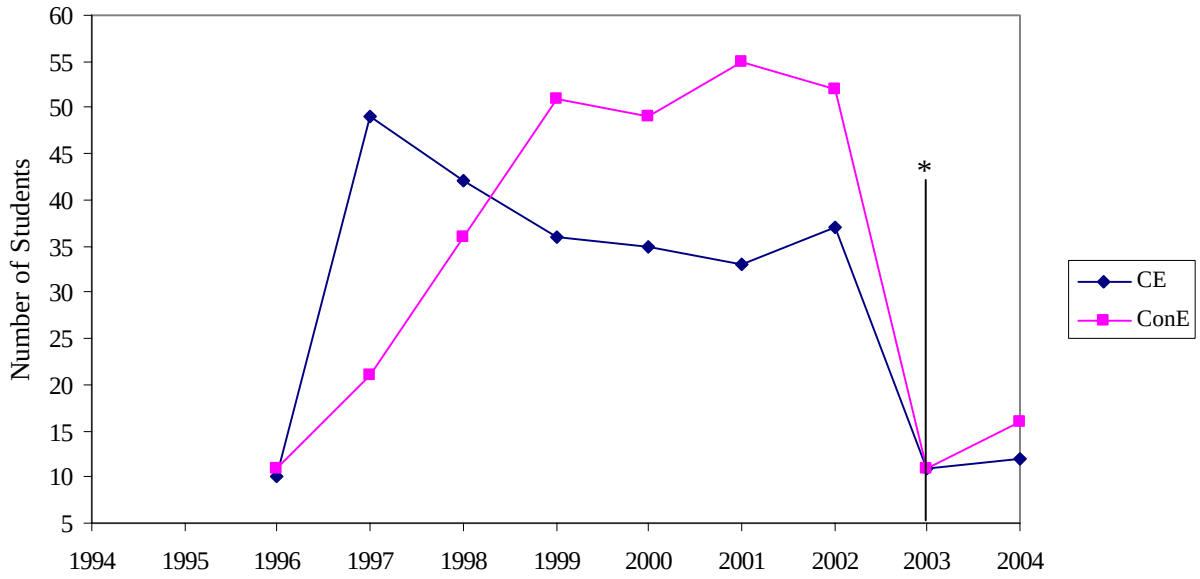


Coop Program Participation



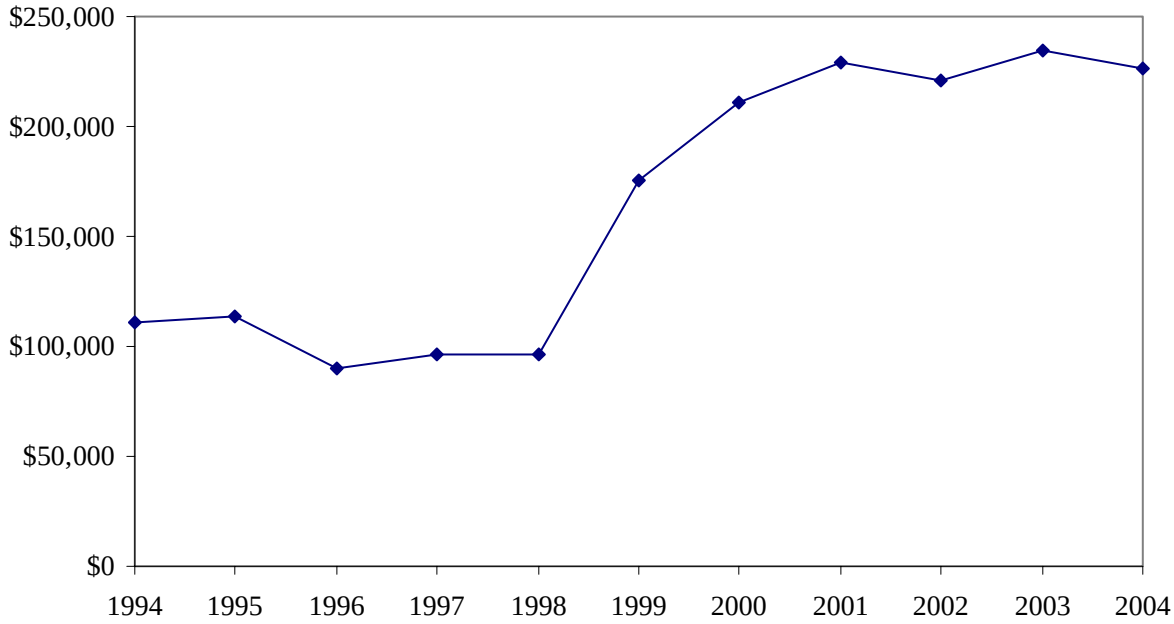
* Beginning 2003, numbers represent students out; earlier years show students in program.

Intern Program Participation

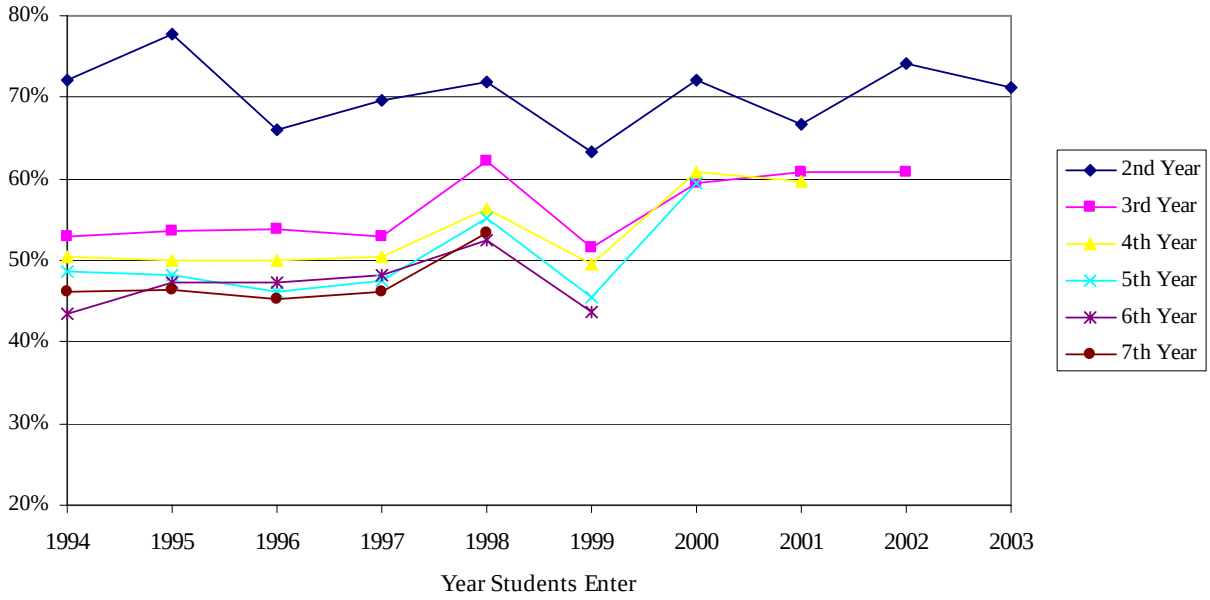


* Beginning 2003, numbers represent students out; earlier years show students in program.

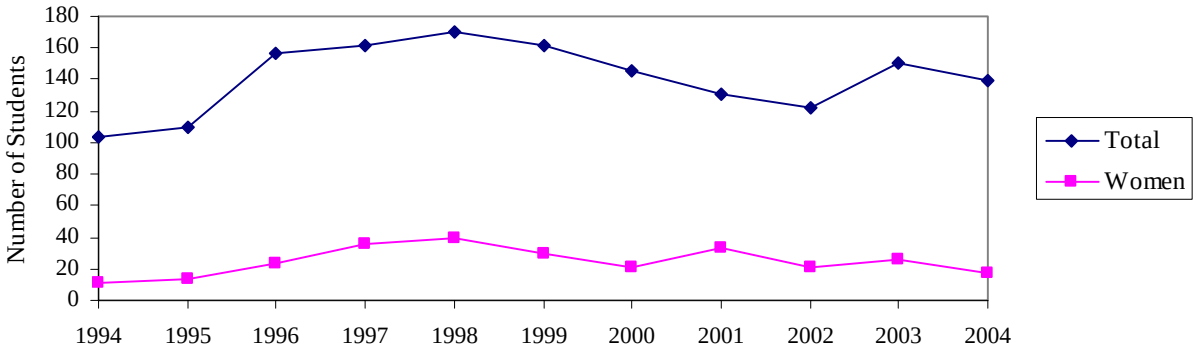
Scholarships



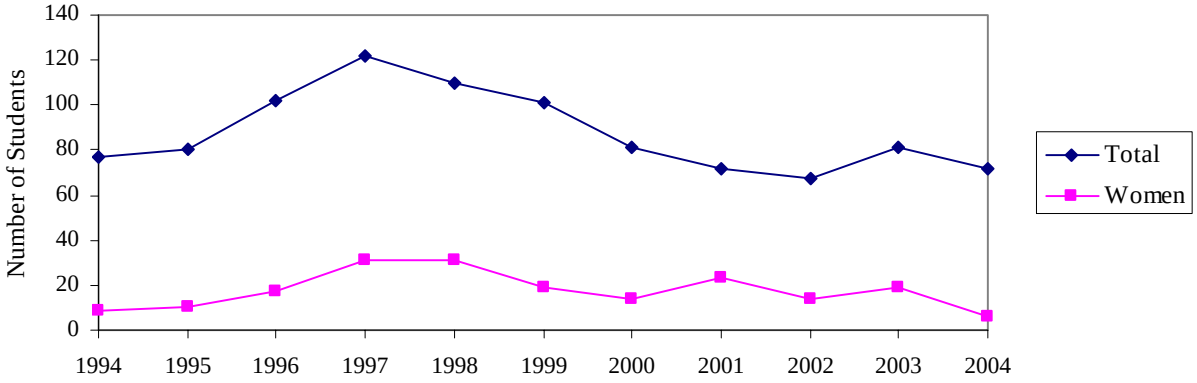
Persistance in Engineering



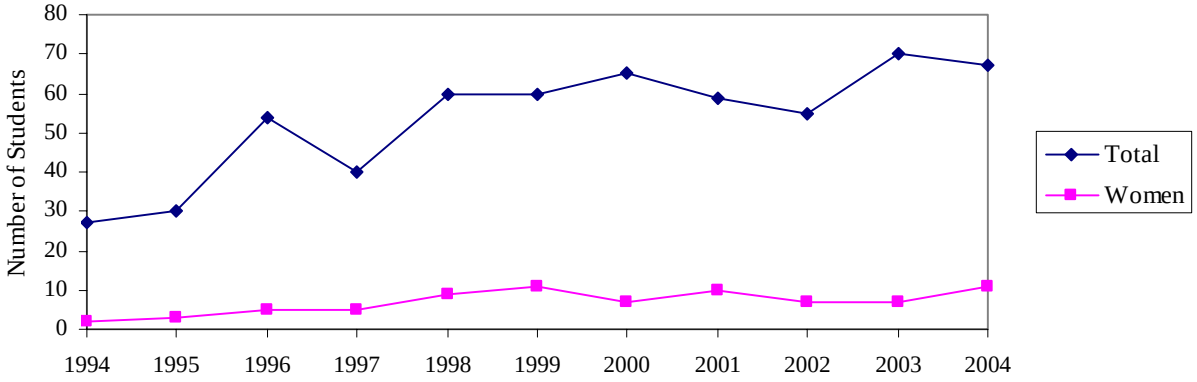
BS Degrees



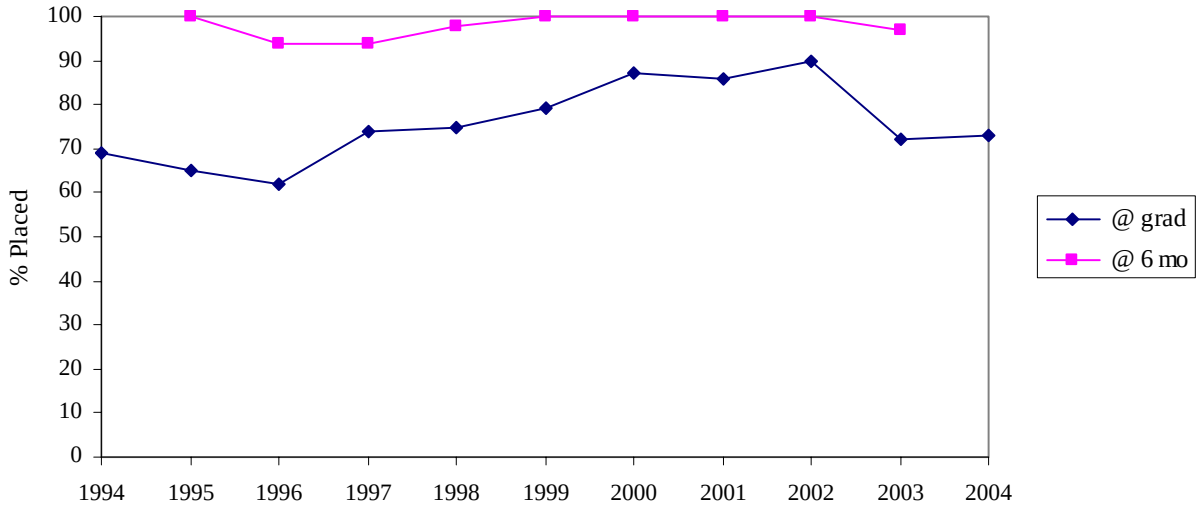
BS Degrees (CE)



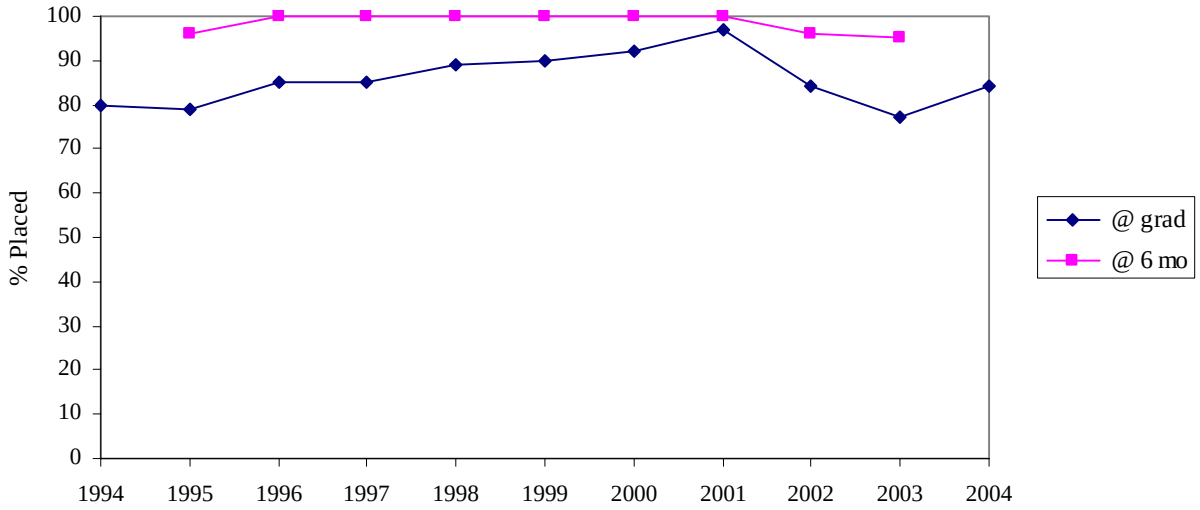
BS Degrees (ConE)



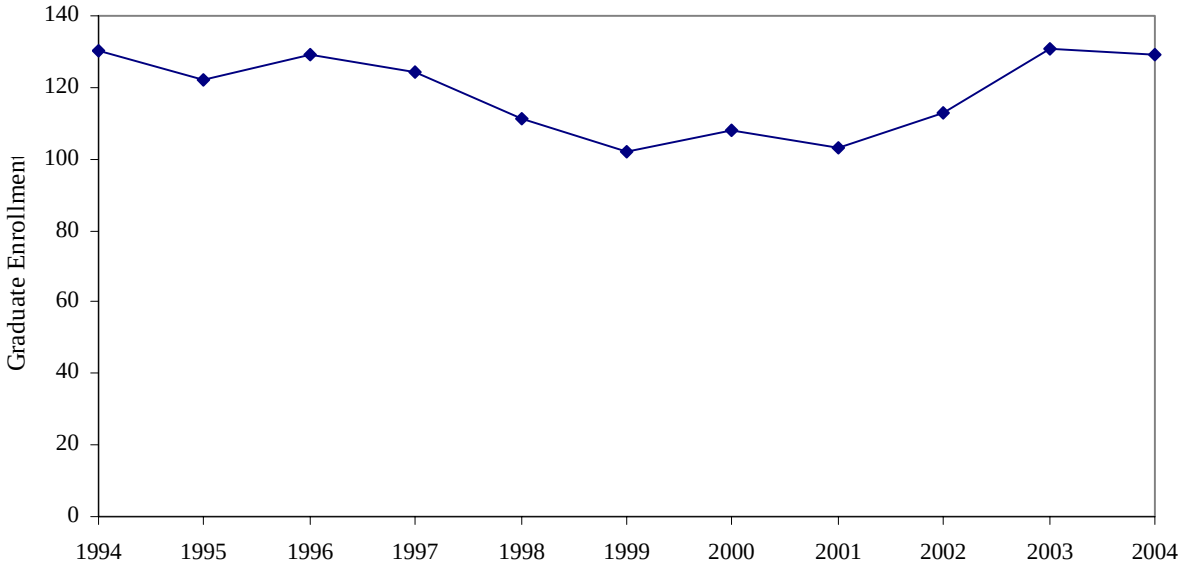
Placement of B.S. Graduates - CE



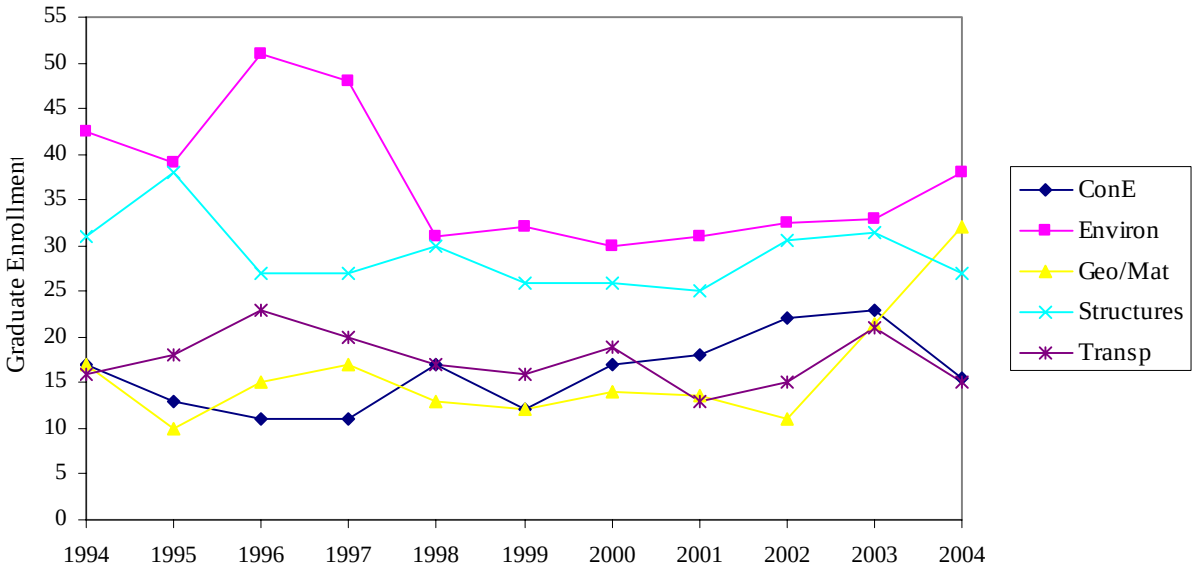
Placement of B.S. Graduates - ConE



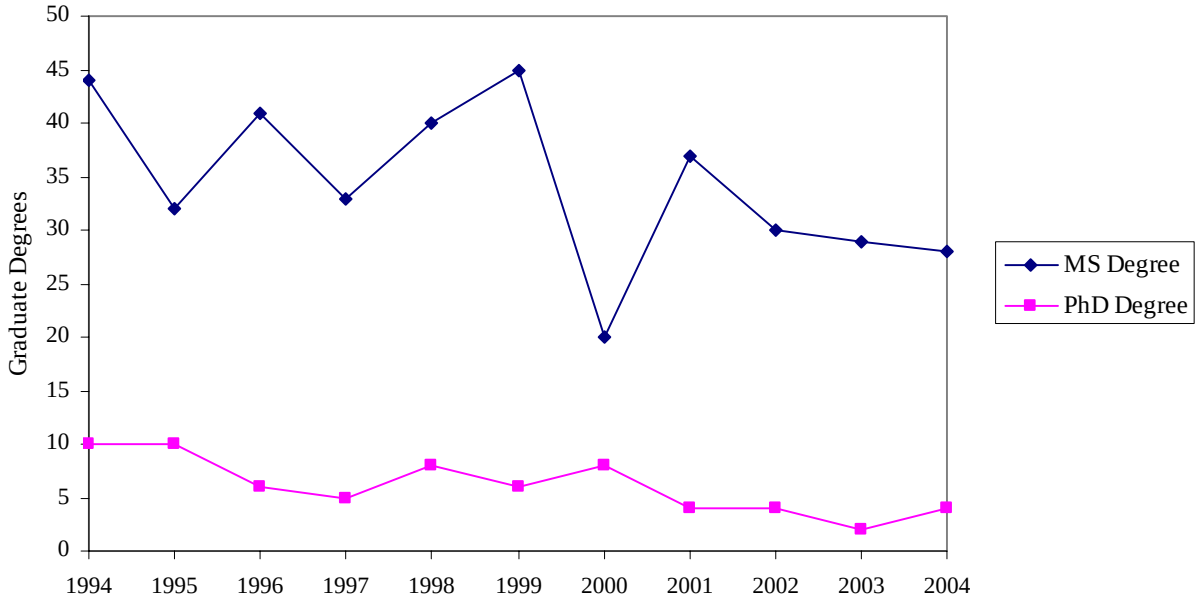
Graduate Enrollment



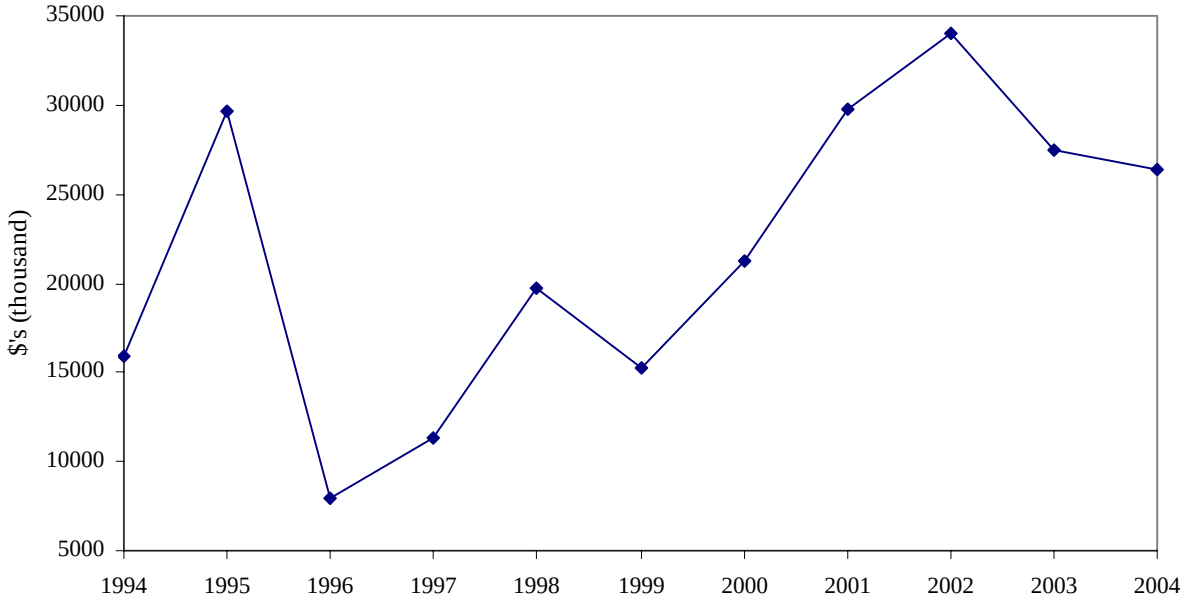
Graduate Enrollment by Division



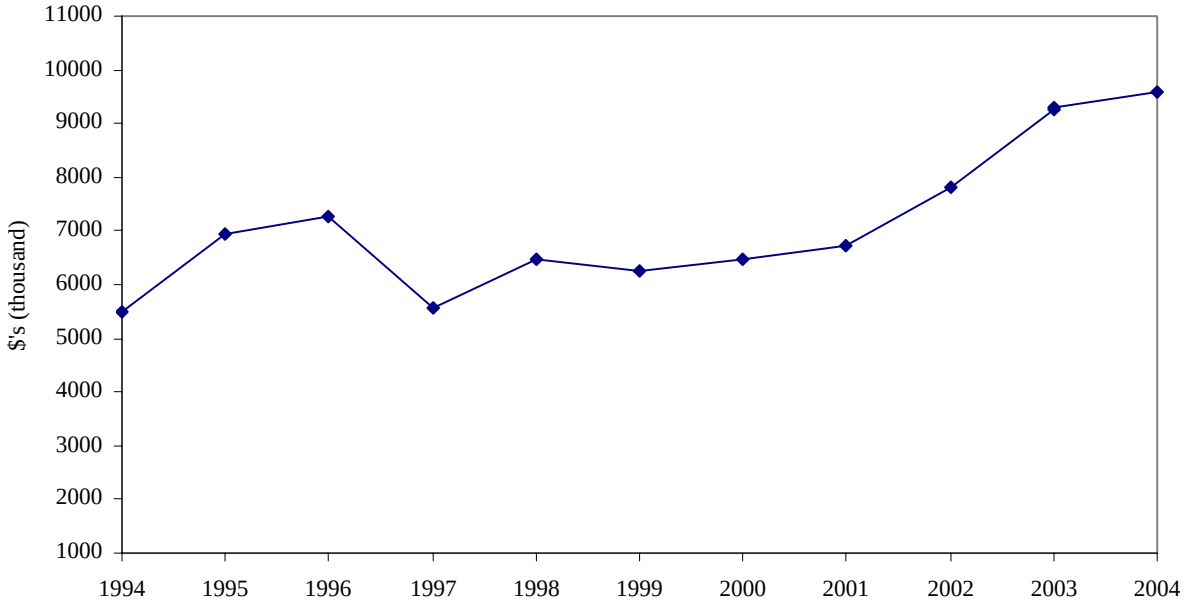
Graduate Degrees



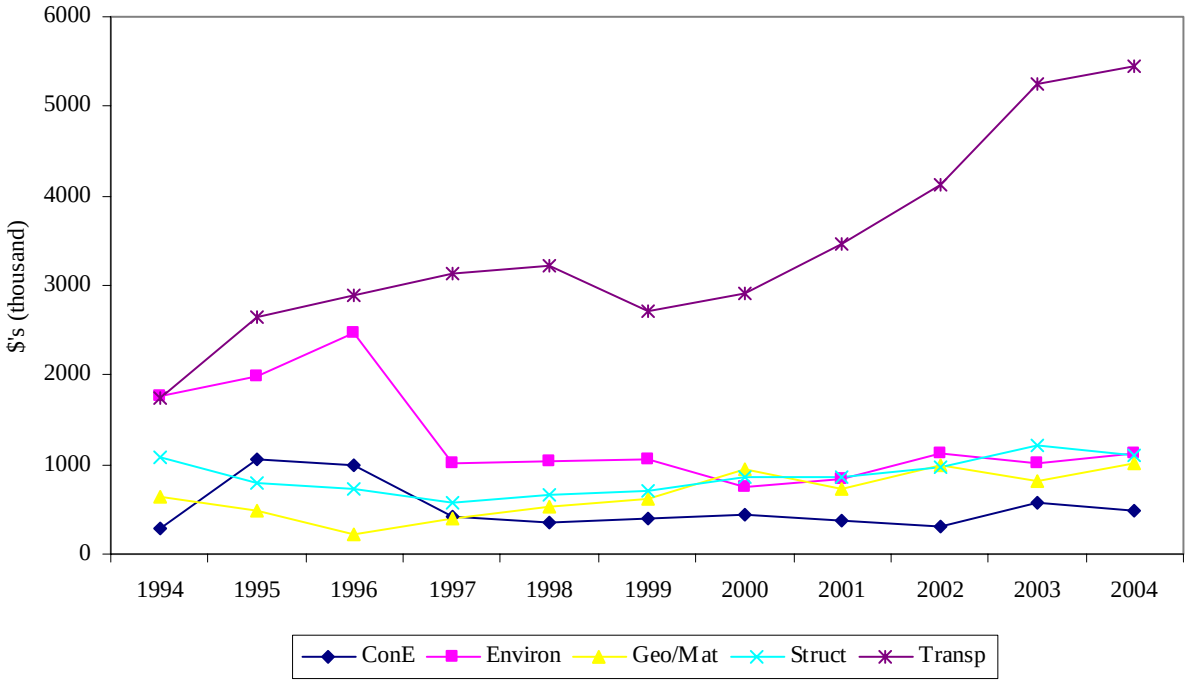
Research Proposal Productivity



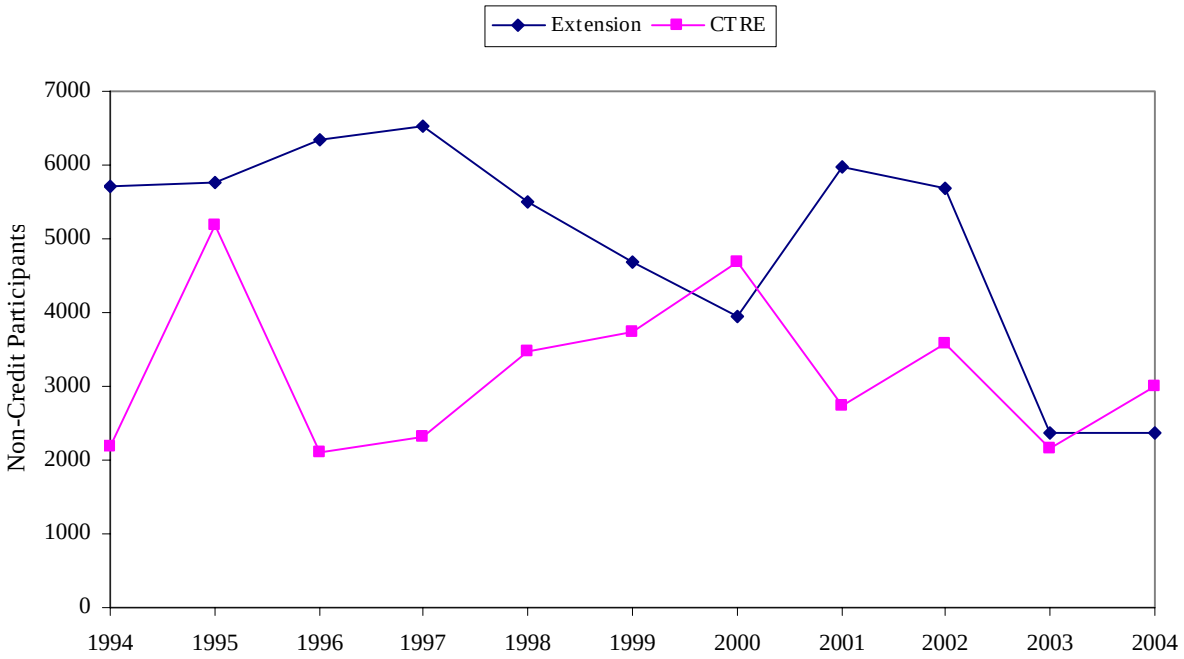
Research Expenditures



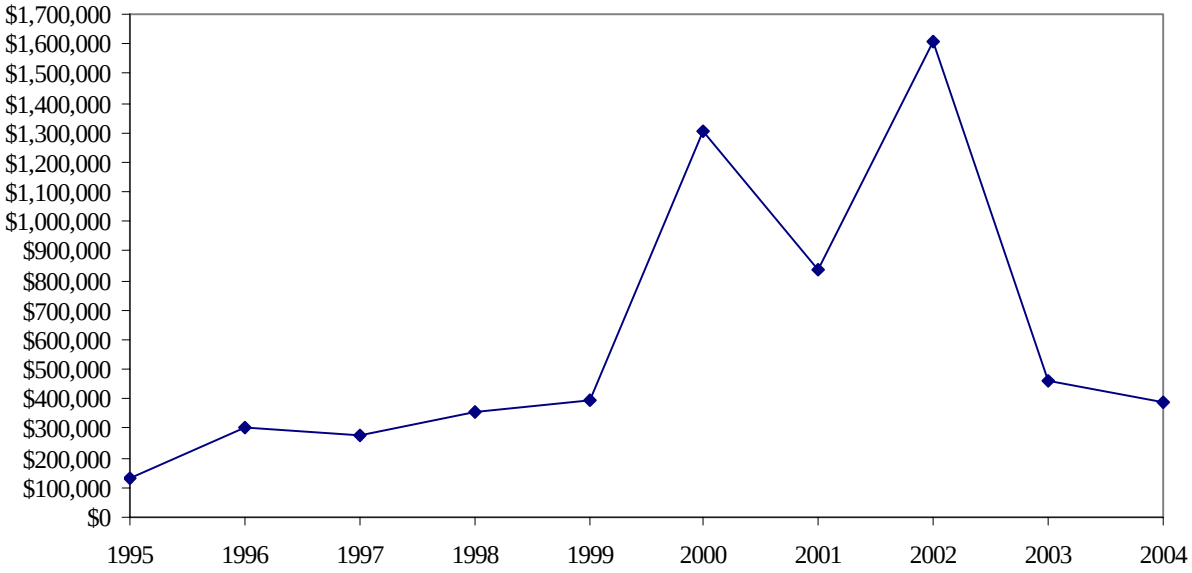
Research Expenditures by Division



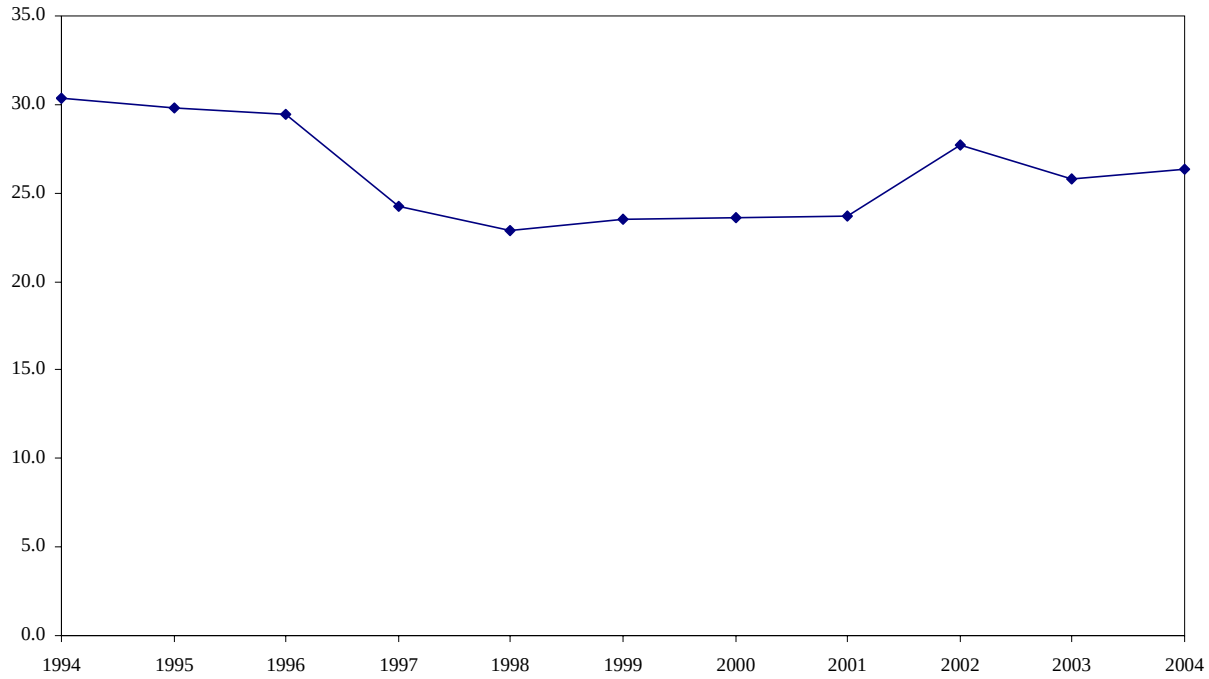
Non-Credit Course Participation



Gift Income



Total Enrollment per FTE



UNDERGRADUATE PROGRAM

	BS Enrollment				BS Enrollment (CE)				BS Enrollment (ConE)			
Fall	Total	Women	Minority*	Intrn'l	Total	Women	Minority*	Intrn'l	Total	Women	Minority*	Intrn'l
1994	808	147	35	47	578	118	27	36	230	29	8	11
1995	858	183	46	43	586	143	33	35	262	40	13	8
1996	838	171	39	44	547	133	26	35	291	38	13	9
1997	805	160	29	48	499	118	17	41	306	42	12	7
1998	743	132	23	40	422	86	16	33	321	46	7	7
1999	702	122	19	38	392	84	12	26	310	38	7	12
2000	713	131	25	24	391	96	16	16	322	35	9	8
2001	686	101	32	21	373	72	24	13	313	29	8	8
2002	754	115	36	13	406	82	24	8	348	33	12	5
2003	738	119	45	13	413	87	29	10	325	32	16	3
2004	760	135	50	13	444	107	33	12	316	28	17	1

SCHOLARSHIPS

Acad Year	# Students	Amount
1994	78	$110,701
1995	114	$113,240
1996	81	$90,408
1997	78	$96,728
1998	82	$96,480
1999	107	$175,315
2000	167	$211,234
2001	171	$229,512
2002	176	$220,463
2003	199	$234,762
2004	148	$226,558

COOP PROGRAM PARTICIPATION

	Coop CE	Coop ConE	Intern CE	Intern ConE
1994	35	15		
1995	37	15		
1996	40	11	10	11
1997	27	13	49	21
1998	31	9	42	36
1999	29	9	36	51
2000	28	4	35	49
2001	34	8	33	55
2002	27	7	37	52
2003*	9	2	11	11
2004	3	1	12	16

*Beginning 2003, numbers represent students out; earlier years are students in program

PERSISTANCE AT IOWA STATE AND IN THE COLLEGE OF ENGINEERING

Full Time Freshmen

Entry		Beg of 2nd Year		Beg of 3rd Year		Beg of 4th Year		Beg of 5th Year		Beg of 6th Year		Beg of 7th Year	
Year	Number	College	Univ	College	Univ	College	Univ	College	Univ	College	Univ	College	Univ
1994	115	72.2%	87.7%	53.0%	75.7%	50.4%	74.8%	48.7%	72.2%	43.5%	67.0%	46.1%	69.6%
1995	112	77.7%	81.3%	53.6%	72.3%	50.0%	71.4%	48.2%	68.8%	47.3%	67.9%	46.4%	67.0%
1996	106	66.0%	83.0%	53.8%	73.6%	50.0%	73.6%	46.2%	70.8%	47.2%	71.7%	45.3%	68.9%
1997	119	69.7%	85.7%	52.9%	78.2%	50.4%	77.3%	47.5%	72.9%	48.3%	72.9%	46.2%	71.4%
1998	103	71.8%	84.5%	62.1%	79.6%	56.3%	75.7%	55.3%	75.7%	52.4%	70.9%	53.4%	71.8%
1999	101	63.4%	83.2%	51.5%	78.2%	49.5%	74.3%	45.5%	70.3%	43.6%	69.3%		
2000	79	72.2%	84.8%	59.5%	78.5%	60.8%	79.7%	59.5%	79.7%				
2001	87	66.7%	81.6%	60.9%	79.3%	59.8%	73.6%						
2002	97	74.2%	87.6%	60.8%	80.4%								
2003	94	71.3%	86.2%										

Persistence includes students still enrolled and those who have graduated

UNDERGRADUATE PROGRAM (continued)

Acad	BS Degrees				BS Degrees (CE)				BS Degrees (ConE)			
Year	Total	Women	Minority*	Intrn'l	Total	Women	Minority*	Intrn'l	Total	Women	Minority*	Intrn'l
1994	104	11	3	4	77	9			27	2		
1995	110	13	3	7	80	10			30	3		3
1996	156	23	10	13	102	17		9	54	5		
1997	162	36			122	31			40	5		
1998	170	40	5	14	110	31	1	13	60	9	4	1
1999	161	30	6	10	101	19	4	10	60	11	2	
2000	146	21	4	13	81	14	2	10	65	7	2	3
2001	131	33	4	9	72	23	2	7	59	10	2	2
2002	122	21	3	7	67	14	3	4	55	7	0	3
2003	151	26	2	5	81	19	1	2	70	7	1	3
2004	139	17	6	4	72	6	3	2	67	11	3	2

PLACEMENT OF B.S. GRADUATES

Acad	CE					Average	ConE					Average
	No.	No. Who	Offers/	% Placed		Starting	No.	No. Who	Offers/	% Placed		Starting
Year	Grads	Interviewed	Grad	@ grad	@ 6 mo	Mo. Salary	Grads	Interviewed	Grad	@ grad	@ 6 mo	Mo. Salary
1994	80	53	0.7	69		2241	25	23	0.5	80		2626
1995	81	52	1.1	65	100	2480	35	29	2.0	79	96	2727
1996	101	49	.0.6	62	94	2625	48	39	1.8	85	100	2746
1997	122	81	0.9	74	94	2665	47	42	1.9	85	100	2883
1998	114	78	1.0	75	98	2850	61	52	1.9	89	100	3017
1999	86	69	1.7	79	100	2967	59	58	2.4	90	100	3227
2000	83	61	1.8	87	100	3045	67	62	2.7	92	100	3344
2001	73	60	1.8	86	100	3278	60	58	2.4	97	100	3524
2002	67	57	1.8	90	100	3396	55	52	1.8	84	96	3689
2003	81	42	1.1	72	97	3395	70	69	1.5	77	95	3699
2004	69		0.8	73		3461	65		1.4	84		3849

PLACEMENT OF B.S. GRADUATES WITH ENGINEERING EXPERIENCE

Acad	CE	#	%	#	%	#	%	ConE	#	%	#	%	#	%
Year	# Reporting	Coop	Placed	Intern	Placed	Summer	Placed	# Reporting	Coop	Placed	Intern	Placed	Summer	Placed
1994														
1995	32	3	15	4	12	22	67	23	4	17	0	0	14	61
1996	53	5	80	1	100	30	80	16	2	100	5	100	8	75
1997	118	11	64	5	80	58	76	46	3	100	10	89	23	83
1998	112	6	100	21	81	58	72	61	2	100	10	100	36	86
1999	78	11	92	16	100	34	74	51	2	100	16	94	27	90
2000	83	9	89	18	94	32	84	67	5	100	24	96	29	93
2001	73	5	100	15	80	28	96	60	3	100	19	100	28	96
2002	71	8	63	23	96	28	96	57	0	0	23	91	24	88
2003	86	6	100	29	83	32	69	75	4	100	29	79	37	76
2004	69	9	78	13	77	29	76	65	1	0	20	82	34	92

GRADUATE PROGRAM

Grad Enrollment

Fall	Total	Women	Minority*	Intrn'l	ConE	Environ	Geo/Mat	Structures	Transp	Other
1994	130	20		60	17	42.5	17	31	16	4.5
1995	122	16		45	13	39	10	38	18	
1996	129	18	2	45	11	51	15	27	23	2
1997	124	27	2	47	11	48	17	27	20	1
1998	111	26	3	44	17	31	13	30	17	3
1999	102	24	1	58	12	32	12	26	16	4
2000	109	21	3	62	17	30	14	26	19	3
2001	103	17	2	47	18	31	13.5	25	13	2.5
2002	113	15	6	52	22	32.5	11	30.5	15	2
2003	131	22	6	68	23	33	21.5	31.5	21	1
2004	129	24	2	69	15.5	38	32	27	15	1.5

MS Degrees

Acad Year	Total	Women	Minority*	Intrn'l	ConE	Environ	Geo/Mat	Structures	Transp	Other
1994	44	7		15	3	15	8.5	9.5	5	
1995	32	6	2	12	4	7	8	11	8	
1996	41	6	10	13	9	12	4	7	5	
1997	33	4		14	1	13	5	8	6	
1998	40	4	1	10	5	16	7	7	5	
1999	45	11	2	14	6	12	7	13	6	1
2000	20	5	1	5	3	5	2	7	1	2
2001	37	8	1	23	8.5	6	6	8	8	0.5
2002	30	9	0	15	4	9	6	6	5	0
2003	29	4	0	12	6	6	6	9	1.5	0.5
2004	28	6	3	11	6	8	3.5	7	3	0.5

PhD Degree

Acad Year	Total	Women	Minority*	Intrn'l	ConE	Environ	Geo/Mat	Structures	Transp	Other
1994	10	1		6		5	2	4	1	1.5
1995	10	1		7		3	2	2	1	3
1996	6			5		1		2		
1997	5			3		3	1	1	0	
1998	8			7	1	3		2	2	
1999	6	2		4		2	1		1	2
2000	8	2		6		5	1	1	1	
2001	4	1		1		0.5	1	1	1	0.5
2002	4	0	0	4	1	0	2	0	1	0
2003	2	0	0	2	0	0	2	0	0	0
2004	4	0	0	1	0	0.5	0	1	2	0.5

RESEARCH

Proposal Productivity

	Number		$ (thousand)	$ (thousand)
Fiscal Year	Submitted	Funded	Submitted	Funded
1994	92	90	15897	2856
1995	83	73	29632	6794
1996	84	46	7957	3364
1997	103	60	11281	6891
1998	88	28	19684	4206
1999	109	109	15261	7915
2000	117	98	21257	9167
2001	131	119	29772	14191
2002	186	125	33971	9978
2003	156	119	27470	10898
2004	189	155	26328	15387

Research Expenditures

	$ (thousand)										% Faculty with
Fiscal Year	Total	Federal	State	Industry	ConE	Environ	Geo/Mat	Struct	Transp	Other	80% Exp
1994	5499	3412	1776	310	278	1763	642	1075	1740		24
1995	6944	4317	2107	521	1053	1989	479	786	2638		25
1996	7265	4150	2349	668	982	2461	221	717	2883		18
1997	5551	1947	2747	716	416	1020	406	571	3138		25
1998	6482	3762	1803	751	345	1043	521	659	3230	684	29
1999	6237	1442	3526	1069	389	1069	628	698	2704	749	33
2000	6457	967	3482	1619	435	740	948	859	2916	559	25
2001	6729	1259	4068	782	375	842	720	867	3466	460	31
2002	7811	1668	4064	736	300	1119	1001	974	4115	302	31
2003	9309	1974	4067	1366	568	1004	811	1220	5258	448	30
2004	9588	3345	5014	1229	483	1120	1013	1102	5459	411	33

OUTREACH

Fiscal Year	Extension # Non-credit Courses	Extension # Non-credit Students	CTRE # Non-credit Students	Other CCE # Non-credit Students
1990	66	5333	1646	
1991	49	4192	1438	
1992	63	5117	1679	
1993	63	5407	2074	
1994	75	5709	2194	
1995	66	5763	5188	
1996	65	6343	2096	
1997	70	6526	2308	
1998	55	5498	3464	
1999	48	4682	3729	
2000	38	3955	4696	535
2001	62	5985	2745	
2002	51	5682	3585	
2003	20	2381	2146	516
2004	20	2357	2988	1155

GIFT INCOME

	FY 94-95	FY 95-96	FY 96-97	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY02/03	FY03/04
Gift Recipts										
Outright Gifts	70,537	73,641	98,956	151,679	119,204	356,117	157,428	1,371,994	112,163	195,272
Pledge Payments	73,977	65,526	44,468	33,666	62,137	67,663	94,478	233,879	354,537	251,465
Deferred Payments	0	0	0	100,000	25,000	788	0	0	0	0
Total	144,514	139,167	143,424	285,345	206,341	424,568	251,906	1,605,873	466,700	446,737
New Commitments										
Pledge Commitments	58,562	17,271	32,705	120,090	50,817	49,340	675,900	220,284	342,400	197,025
Deferred Commitments	0	210,000	169,637	0	287,500	900,788	0	115,000	5,250	0
Prior Period Adjustment										(2,830)
Total	58,562	227,271	202,342	120,090	338,317	950,128	675,900	335,284	347,649	194,195
Less Payments										
Pledge Payments	(73,877)	(64,426)	(43,368)	(47,541)	(62,037)	(67,513)	(93,453)	(234,779)	(353,762)	(251,465)
Deferred Payments	0	0	0	0	(25,000)	(788)	0	0	0	0
Total	(73,877)	(64,426)	(43,368)	(47,541)	(87,037)	(68,301)	(93,453)	(234,779)	(353,762)	(251,465)
Campaign Total										
Gift Income	129,199	302,012	302,398	357,894	457,621	1,306,395	834,353	1,706,378	460,587	389,470
Less Present Value Discount	0	0	(23,855)	0	(59,873)	(2,982)	0	(101,116)	0	0
Disc Gift Income	129,199	302,012	278,543	357,894	397,748	1,303,413	834,353	1,605,262	460,587	389,470

APPENDIX C

Course Activities, Academic Year 2003-2004

ACTIVITY	COURSES
New Courses	CE 536, CE 582X, CE 555, CE 594A, ConE 251, Engr 320, Trans 555
Courses with world wide web	CE 104, CE 204, CE 303, CE 304, CE 326, CE 332, CE 372, CE 421, CE 428, CE 453, CE 485, CE 486, CE 506, CE 520, CE 521, CE 523, CE 527, CE 571, CE 572, CE 582X, ConE 221, ConE 241, ConE 251, ConE 322, ConE 351, ConE 421, ConE 441, ConE 461, Trans 555
Courses w/hands-on laboratory experience	CE 111, CE 326, CE 360, CE 382, CE 383, CE 421, CE 453, CE 505, CE 520, CE 521, CE 523, CE 565, CE 566B, ConE 241, ConE 251, ConE 322, ConE 351, ConE 421, ConE 461, Trans 555
In-class problems	All classes
Computer usage	All classes
Team experience	CE 111, CE 204, CE 303, CE 304, CE 326, CE 332, CE 333, CE 372, CE 382, CE 383, CE 403, CE 421, CE 428, CE 447, CE 453, CE 485, CE 486, CE 505, CE 506, CE 521, CE 522, CE 527, CE 566B, CE 594A, ConE 221, ConE 241, ConE 251, ConE 322, ConE 351, ConE 421, ConE 441, ConE 461, Trans 555
Oral presentations	CE 204, CE 303, CE 332, CE 421, CE 428, CE 453, CE 485, CE 486, CE 505, CE 506, CE 520, CE 521, CE 522, CE 523, CE 527, CE 541, CE 555, CE 565, CE 566B, CE 569, CE 594A, ConE 210, ConE 221, ConE 241, ConE 322, ConE 421, ConE 461
Written presentations	CE 104, CE 111, CE 204, CE 303, CE 304, CE 326, CE 332, CE 360, CE 372, CE 382, CE 383, CE 403, CE 421, CE 428, CE 453, CE 485, CE 486, CE 505, CE 520, CE 521, CE 522, CE 523, CE 527, CE 541, CE 542, CE 565, CE 571, CE 572, CE 582X, CE 594A, ConE 210, ConE 221, ConE 322, ConE 380, ConE 421, ConE 441, ConE 461, Trans 555
Significant design Experiences	CE 326, CE 333, CE 372, CE 382, CE 383, CE 428, CE 447, CE 453, CE 485, CE 486, CE 505, CE 520, CE 522, CE 523, CE 527, CE 533, CE 535, CE 561, CE 571, CE 572, CE 582X, CE 594A, ConE 322, ConE 351, ConE 421, ConE 441, ConE 461
Field trips/ Construction Site Visits	CE 104, CE 326, CE 383, CE 421, CE 428, CE 505, CE 506, CE 520, CE 521, CE 522, CE 523, CE 527, CE 535, CE 582X, ConE 241, ConE 251, ConE 322, ConE 421, ConE 461

ACTIVITY	COURSES
Contact with practicing Engineers	CE 104, CE 303, CE 304, CE 332, CE 355, CE 382, CE 383, CE 428, CE 453, CE 485, CE 486, CE 505, CE 520, CE 522, CE 523, CE 527, CE 555, CE 566B, CE 582X, ConE 351, ConE 421, ConE 461
Ethics cases	CE 104, CE 303, CE 428, CE 485, CE 486, CE 520, CE 523, ConE 221, ConE 380, ConE 421, ConE 441, ConE 461
Team teaching	CE 332, CE 382, CE 485, CE 486, ConE 221, ConE 421, EE 491, EE 492, Trans 555
Other Unique Student Learning Experiences	CE 303, CE 332, CE 485, CE 486, CE 541, CE 566B, ConE 461
Course evaluations	All classes

Faculty Development in Teaching/Learning, Calendar Year 2004

ACTIVITY	FACULTY
Center for Teaching Excellence Programs	Cable, Ceylan, Sharma, Sirotiak, Walters
ExCEED ASCE Teaching Workshops	Cormicle
WebCT, Instructional Technology Center	
Workshop on Ethics	Cable

Fall 2003 Employers

Ament, Inc.	CE	Kimley-Horn and Assoc.	CE
American Constructors	ConE	Kansas DOT	CE
Cramer and Associates	ConE	McClure Engineering	CE
EFCO	CE, ConE	Peterson Contractor's Inc.	ConE
Elliott & Wood Inc.	ConE	Pulte Homes Corporation	ConE
Enclos Corporation	CE	RMCI	ConE
Hensel Phelps	ConE	Ryan Companies, The	ConE
HNTB	CE	Snyder & Associates	CE
ISU	CE	TeKippe Engineering, P.C.	CE
J.E. Dunn Construction	ConE	TIC-The Industrial Company	ConE
Jensen Construction	ConE	US Navy	ConE
John F. Lutjen and Assoc.	CE	Walsh Construction	ConE
Jones County Engineer's	CE	Weis Builders, Inc.	ConE
JVC Builders	ConE	Weitz Co.	ConE
Kess & Associate	CE		

Evaluation of Instruction, Academic Year 2003-04
College of Engineering

	MEAN F03	MEAN S04
Text and Course:		
1. The text materials for this course were: 1. Too elementary 2. Too difficult 3. Satisfactory	2.90	2.87
2. The pace of this course was: 1. Too elementary 2. Too difficult 3. Satisfactory	2.81	2.81
3. The objectives of the course were: 1. Not stated 2. Not attained 3. Attained	2.89	2.87
4. The catalog prerequisites for this course were appropriate: 1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5.Strongly agree	3.74	3.77
5. The exams were fair: 1. Strongly disagree 2. Disagree 3. Neutral 4. Agree 5.Strongly agree	3.66	3.60

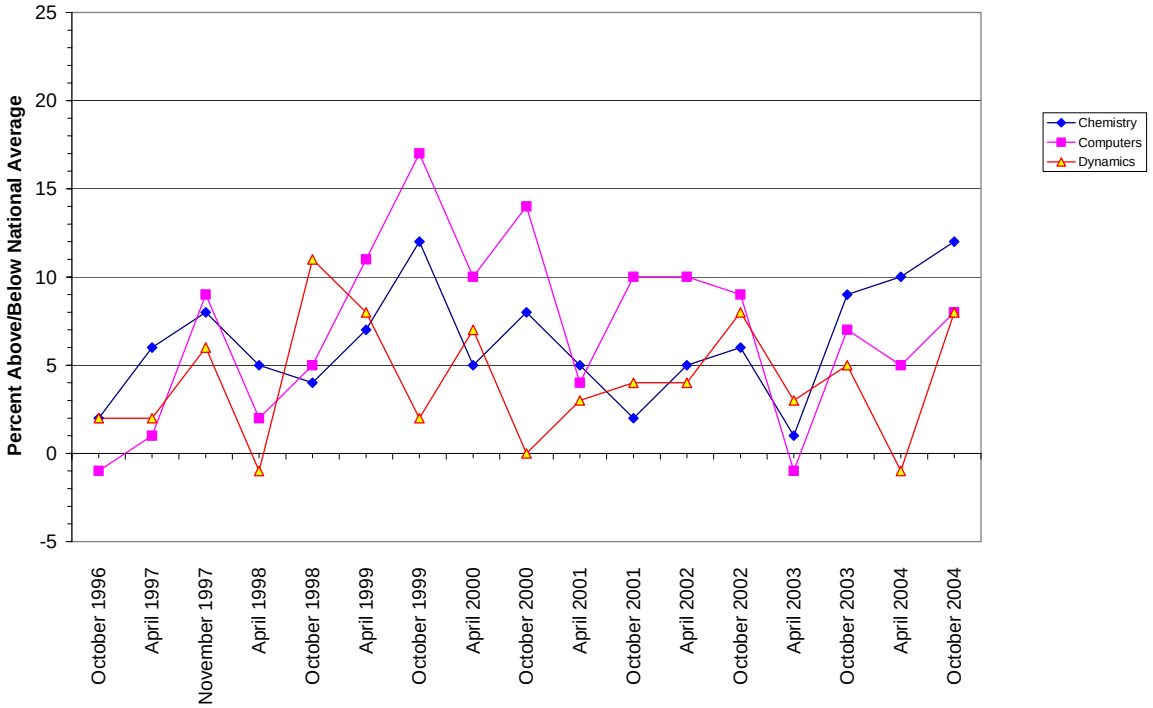
Instructor: For items 6-15, use the following 1 to 5 scale:

1. Poor	2. Marginally Satisfactory	3. Satisfactory	4. Good	5. Excellent

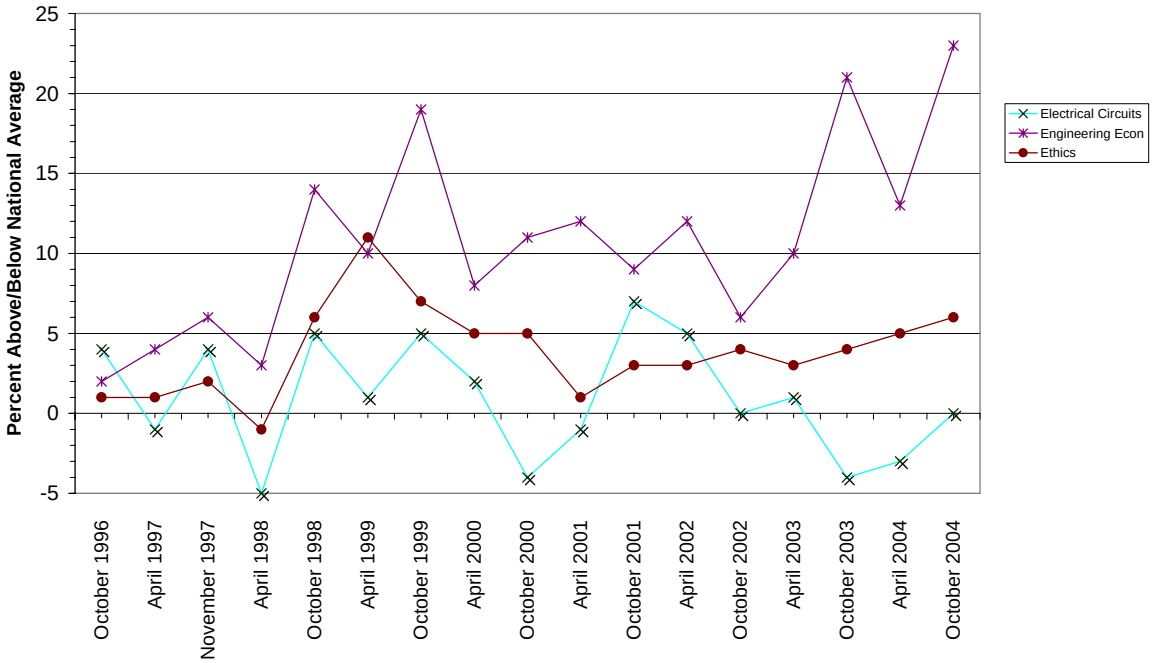
6. The instructor's ability to communicate in a clear and understandable manner was:	4.01	3.99
7. The apparent level of the instructor's knowledge of the subject was:	4.40	4.31
8. The enthusiasm demonstrated by the instructor for teaching the class was:	4.20	4.18
9. The degree of organization exhibited by the instructor was:	3.89	3.81
10. The instructor's use of class time was:	3.91	3.80
11. The extent to which the instructor created a positive learning environment in which you felt comfortable was:	4.02	4.01
12. The instructor's ability to hold your attention was:	3.70	3.60
13. The fairness shown by the instructor was:	4.05	4.00
14. The instructor's availability outside the class was: Answer only if you have direct knowledge:	4.02	3.90

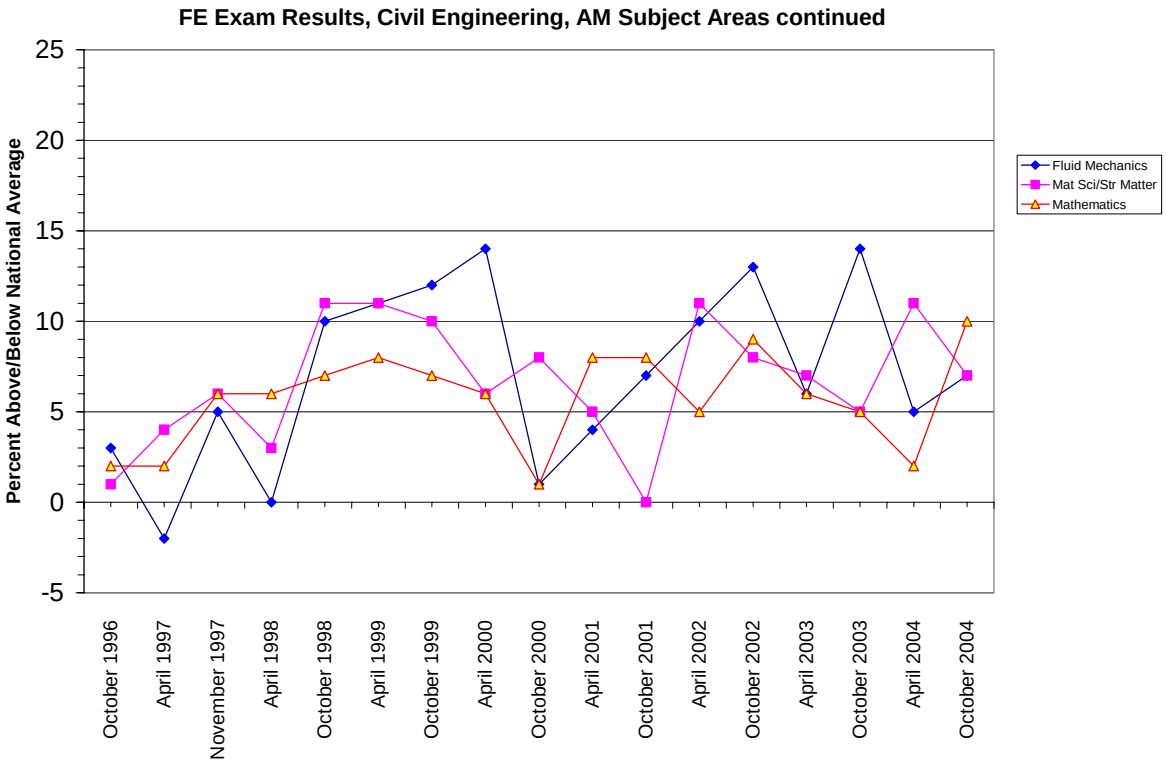
	Fall 2003				Spring 2004			
	100-200 level	300-400 level	500-600 level	Combined	100-200 level	300-400 level	500-600 level	Combined
15. The overall teaching effectiveness of the instructor was:	4.13	3.90	4.08	3.96	3.92	3.92	4.21	3.89

FE Exam Results, Civil Engineering, AM Subject Areas



FE Exam Results, Civil Engineering, AM Subject Areas continued




FE Exam Results, Civil Engineering, AM Subject Areas continued
Percent Above/Below National Average
25
20
15
10
5
0
-5
October 1996
April 1997
November 1997
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October 1998
April 1999
October 1999
April 2000
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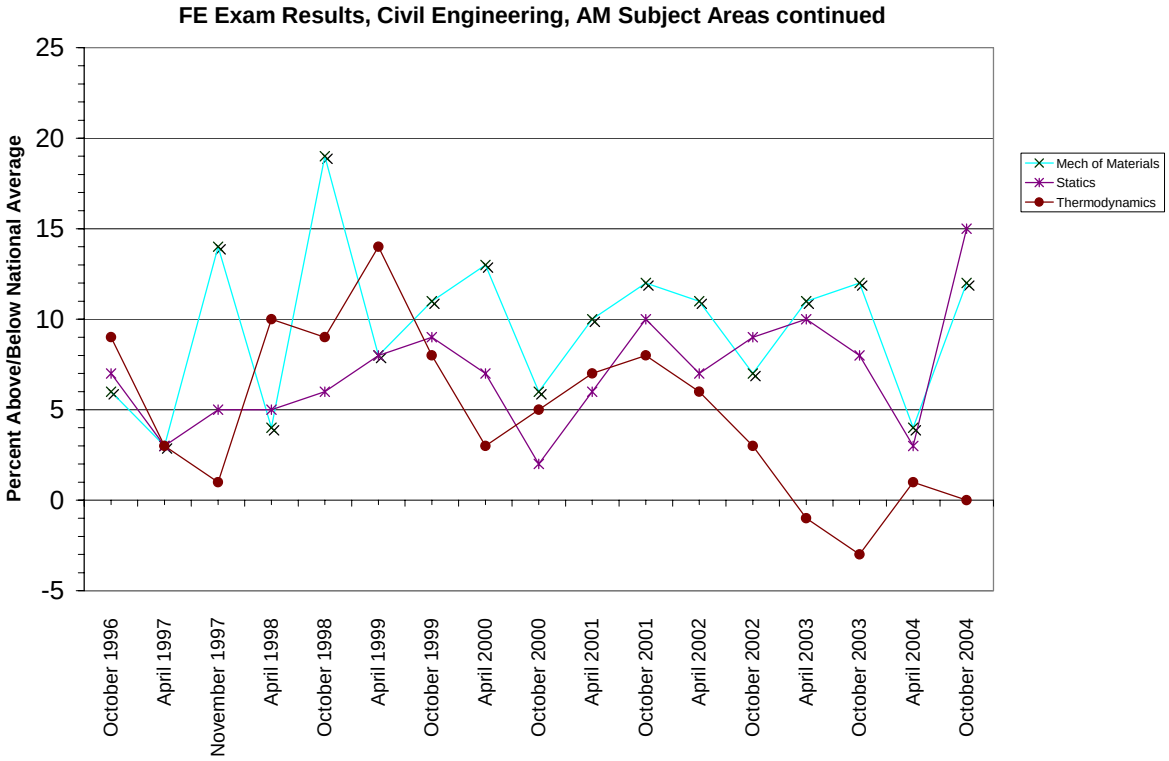
April 2001
October 2001
April 2002
October 2002
April 2003
October 2003
April 2004
October 2004
Fluid Mechanics
Mat Sci/Str Matter
Mathematics


FE Exam Results, Civil Engineering, AM Subject Areas continued
Percent Above/Below National Average
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10
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October 1996
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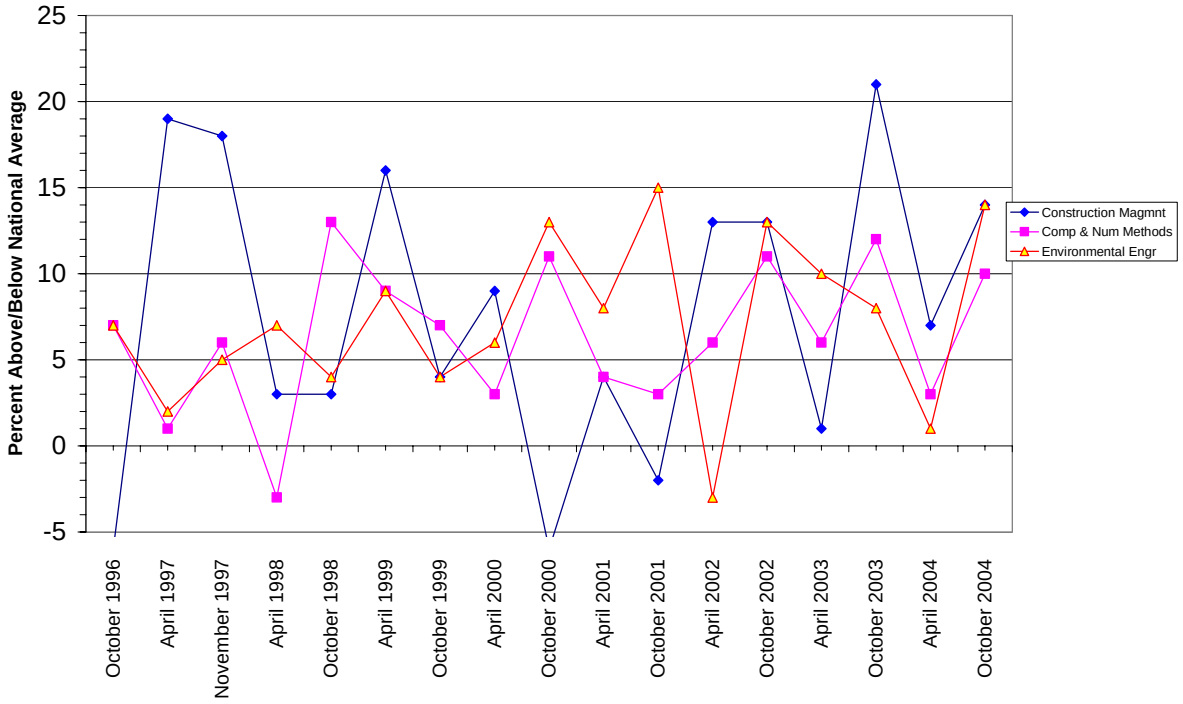
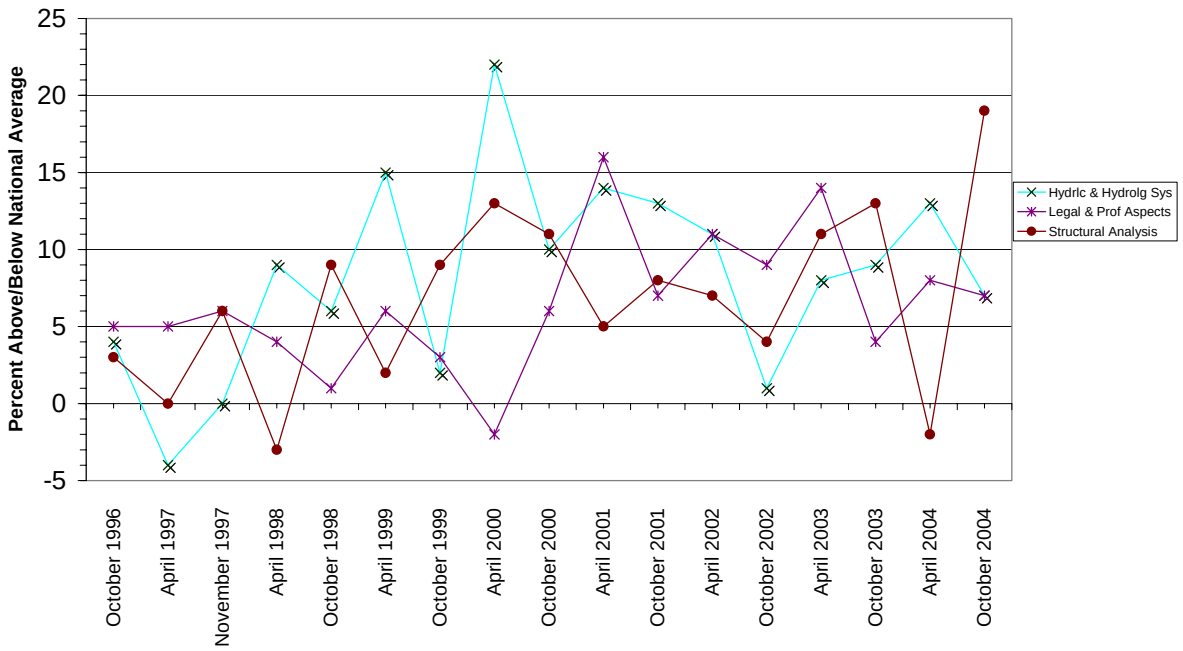
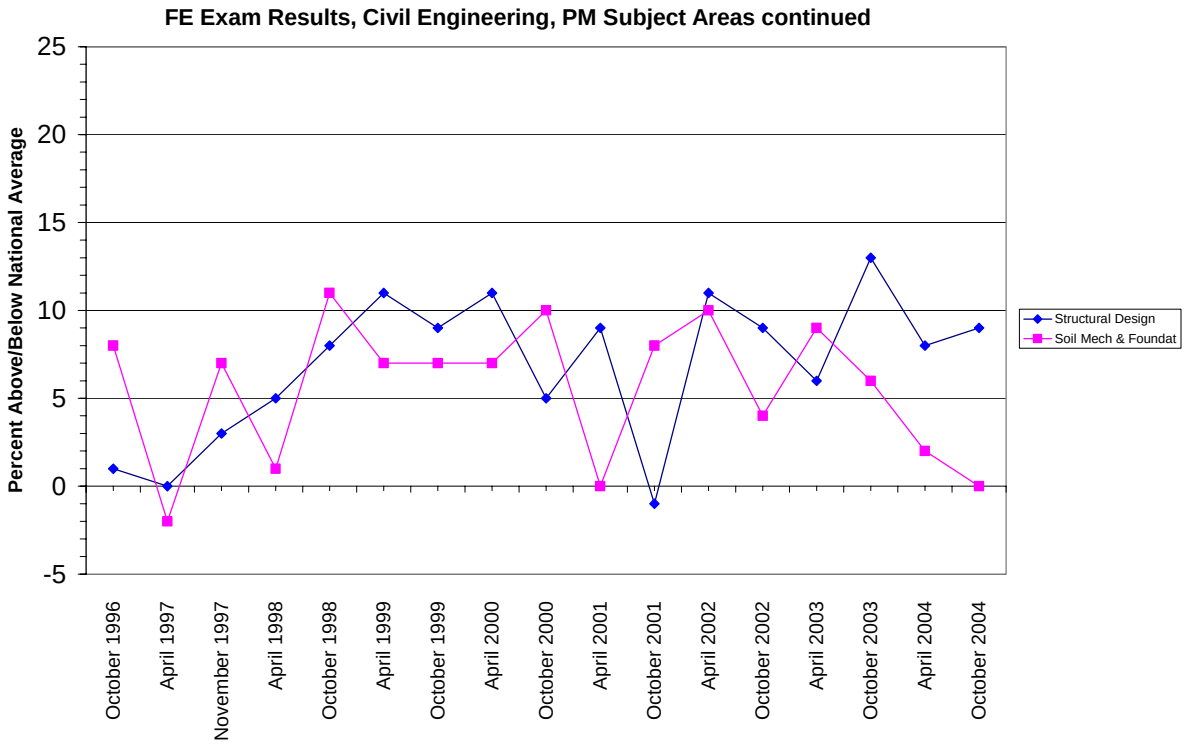
October 2003
April 2004
October 2004
Mech of Materials
Statics
Thermodynamics

FE Exam Results, Civil Engineering, PM Subject Areas



FE Exam Results, Civil Engineering, PM Subject Areas continued




FE Exam Results, Civil Engineering, PM Subject Areas continued
Percent Above/Below National Average
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15
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October 1996
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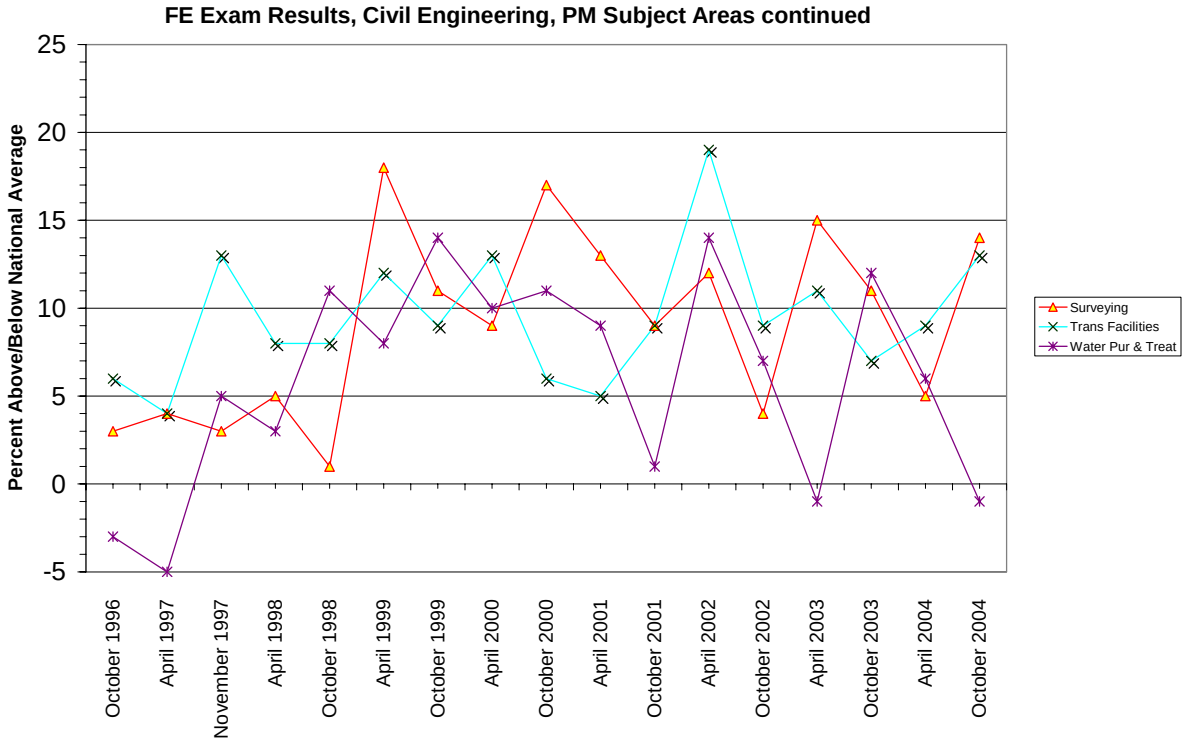
April 2004
October 2004
Structural Design
Soil Mech & Foundat


FE Exam Results, Civil Engineering, PM Subject Areas continued
Percent Above/Below National Average
25
20
15
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-5
October 1996
April 1997
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October 2000
April 2001
October 2001
April 2002
October 2002
April 2003
October 2003
April 2004
October 2004
Surveying
Trans Facilities
Water Pur & Treat

Fundamentals of Engineering Examination Data

	Exam Date	No. Examinees Taking	No. Examinees Passing	% Examinees Passing
ISU	October 2004	23	22	96
National		1809	1354	75
ISU	April 2004	29	26	90
National		2808	2139	76
ISU	October 2003	27	27	100
National		1684	1364	81
ISU	April 2003	43	42	98
National		2530	1980	78
ISU	October 2002	25	25	100
National		1688	1369	81
ISU	April 2002	42	40	95
National		2337	1801	77
ISU	October 2001***	22	21	95
National		1804	1449	80
ISU	April 2001*	44	42	95
National		3881	2901	75
ISU	October 2000**	21	19	90
National		2522	1937	77
ISU	April 2000**	67	60	90
National		2227	1683	76
ISU	October 1999*	27	26	96
National		2589	2018	78
ISU	April 1999	39	39	100
National		2211	1734	78
ISU	October 1998	24	23	96
National		1491	1197	80
ISU	April 1998	42	40	95
National		2144	1746	81
ISU	November 1997	29	29	100
National		1552	1282	83
ISU	April 1997	45	42	93
National		2506	2074	83
ISU	October 1996	46	44	96
National		1610	1352	84

*includes civil-civil and civil-general exams.
**includes civil-civil, civil-general, construction-civil, and construction-general exams.
***includes civil-civil, construction-civil, and construction-general exams

Equipment Purchases FY 2004

Department Funds		$30,695
Desktop computers for faculty & staff (10)	12,691	
Computer for web server	7,834	
Laptops (2)	4,462	
New Kiosk for Town Engineering lobby	1,883	
Equipment upgrades for Teaching Labs 210 & 220	3,825	
Installation and misc. other equipment support		
Faculty Equipment Purchases with Departmental Funds (salary savings)		36,331
D. White (Dell Dual Xeon)	4,257	
D. White (Dell Computer Latitude)	4,122	
J. Cable (Dimension XPS)	3,125	
J. Cable (2 Dell laptops)	6,451	
J. Cable (Weather station)	7,175	
R. Sharma (Dell Laptop)	2,317	
PCC Compression Digital Testing Machine	6,667	
Materials Lab Refrigerated Incubator	2,217	
Scholarship Enhancement Association		32,716
PCC Lab, mobile drill rig and other equipment	25,000	
Telelab (upgrades for Room 407)	5,779	
Laser scanner for embankment fault measurement	1,937	
Continuing Education (Outreach): Mobile workstations (2)		6,451
Research Funded Equipment		11,593
Computer Equipment for NSF Project (Sri, 420-60-15)		
Foundation		30,821
Pitt-Des Moines Stell Professorship – Poweredge 4600	8,204	
Livesay Lab – Upgrade for MTS Systems strain test equip	11,499	
Livesay Lab – Cabinetry, wall panels and casework	11,118	
Computer Lab – Fees (EFTF)		40,149
Plotters for 134 and 110	17,234	
Gigabit Ethernet switches	1,056	
Network adapter cards	224	
Computers	7,340	
Server	6,966	
Server	3,413	
Laptops	3,916	
Total		**$188,756**

Outreach Courses, Academic Year 2003-2004

COURSE TYPE	COURSE	FACULTY
ISU Continuing Education Conferences/Workshops/Short Courses	BCC	Cable (185)
	ICEA	Cable (500)
	ASCE Survey	Cable (150)
	ASCE Transportation	Cable (125)
	PCC Pavement Design	Ceylan (80)
	ASCE Annual Str Conf	Fanous (175-185)
	Construction Project Managers & Supervisors Academy	Jahren (43)
	Thin Maintenance Surface Opportunities	Jahren (160)
	When to Pave a Gravel Road	Jahren (50)
	Iowa ASCE Transp Conf	Klaiber (100)
	Better Concrete Conference	Porter (260)
	See following table (total number is 20 through ISU Extension and 26 through CTRE)	
Saturday and Evening Courses	• Trans 555	Maze (12)
	• CE 527	Ong (8)
Non-ISU Short Courses/ Workshops/Continuing Education Conferences	• NHI Bridge Inspection	Cable (60)
	• Intro to Trenchless Tech	Jahren
	• National NACE Conf	Klaiber (600)
	• Building Better Work Zone	Maze (400)
	• Geotechnical Aspects of Subgrade Material for Road Construction	Schaefer (22)
	• Master Builders of Iowa Cornerstone Series for Emerging Businesses	Strong
	• Iowa Water Pollution Control, Sludge bulking control	van Leeuwen (45)
	• American Water Works Association, Arsenic removal	van Leeuwen (28)

ISU Extension Non-Credit Course List, Fiscal Year 2003-04

Program	Acct #	Chair	Location	Actual Atten.
ICEA Midyear Conference	2401	Cable	Ames, Gateway	137
Bridge Rating Course	2416	Cable	Ames, Gateway	48
ASCE Iowa Section Annual Meeting	2404	Cable	Scheman	86
Midwest Concrete Consortium Fall Mtg	2420	Cable	Ames, Gateway	56
Environmental Impact of Construction & Repair Materials on Surface & Groundwaters Workshop	2420	Cable	Ames, Gateway	8
ASCE/ICEA Surveying Conference	2405	Cable	Scheman	87
ASCE Transportation Conference	2406	Jones	Scheman	134
Better Concrete Conference	2407	Cable	Scheman	146
Self-Consolidating Concrete Workshop	2407	Cable	Scheman	60
ASCE Structural Engineering Conference	2408	Jones	Scheman	178
Iowa County Engineers Conference	2409	Cable	Scheman	464
Prepare and Submit County Budgets	2437	Jahren	Scheman	136
Asphalt Paving Conference	2412	Cable	Scheman	214
Least Squares Surveying Workshop	2435	Cable	Scheman	10
ASCE Geotechnical Conference	2415	Jones	Amana Colonies	66
SLSI Iowa Land Surveyor Conference	2443	Jones	Scheman	297
Iowa DOT Bridge Backwater Program	2433	Jones	Scheman	23
ASCE Environ.& Water Resources Conference	2434	Jones	Scheman	58
Midwest Concrete Consortium Spring Mtg	2420	Cable	Madison, WI	67
Planning, Design, and Approval of Interchange Improvents	2444	Cable	Ames, Comfort Suites	82
				2,357

Center for Transportation Research and Education
2004 Workshops

Topic	# of Classes	Total Attendance
Professional Flagger	12	228
Work Zone Traffic Control/Flagger Training for Utilities	26	554
Registered Flagger	2	30
Incorporating Safety into 3R Roadway Projects	6	150
ISRMSA/APWA Conference	1	105
DOT Work Zone Safety	13	779
Work Zone Safety	3	108
Traffic & Safety Forum for DOT	1	118
Successful Management	3	41
Math Fundamentals	1	6
Route Surveying	1	5
Motor Grader Operator Training	7	228
Truck Engine Idling Workshop	1	69
PCC Design Software Training	1	28
PCC Pavement Design Workshop	1	80
ASCE Pedestrian Crossing Treatments web seminar	1	15
Equipment Operator Trainings	3	142
Municipal Streets Seminar	1	73
PCC Pavement Overlay Workshop	1	110
Designing Pedestrian Facilities for Accessibility	3	63
“Working Together” Workshop	1	56
TOTALS	**89**	**2,988**

Faculty Interactions with Industry & Communities
2004 Calendar Year

	Iowa	Outside Iowa
Clients (one-to-one interactions)	3259	195
(One-to-one interactions are defined as significant interactions with a client of small group of clients)		
Group events	104	77
(Group events include scheduled events such as continuing education presentations for professionals, presentations at extension meetings, and presentations at conferences and workshops that support your outreach and professional practice)		
Advisory role to groups	14	17
(Consider only those significant roles with organizations or groups such as school districts, state agencies, community colleges, chambers of commerce, commodity groups, judicial systems, and business and industry groups)		

Laboratory Activity by Outside Users
FY 2003-04

Analytical Services Lab

ABE
Agronomy
Ames Lab
Chemical Engineering
City of Emmetsburg
Env Health & Safety
FP&M
National Soil Tilth Labs
NREM
Univ of Missouri-Rolla

Materials Analysis and Research Lab

8VA, IA
Akinc, M, Ames Lab
Akinc, M, MSE
American Petrographic Services, MN
Ash Grove, KS
AshTek Industries, NH
Besser, M, Ames Lab
Brown, R, CSET
Burke Marketing, IA
Cackler, T, CTRE
Cann, D, MSE
Cao, L, ME
Chimenti, D, Aero E
City of Aberdeen, SD
City of Cedar Rapids, IA
Cody, R, GAS
Constant, A, MRC
Construction Materials Testing, IA
Corbett, J, IPRT
Dalal, V, MRC
Dawson, R, IA
Fan, M, CSET
Fanous, F., CCEE
Finnemore, D, Ames Lab
Gleeson, B, MSE
Gray, J, CNDE
Hall Engineering, IA
Harrington, D, CTRE
Harrington, D, PCC Lab
Hebert, K, Chem E
Hillier, A, Chem E
Ho, K, Ames Lab
Holcim, MN
Iowa DOT, IA
Iowa State Ready Mix, IA
Jane, J, Food Sci
Jenks, W, Chem
Jenks, W, IPRT
Jose Briceno, MI
Kerford Limestone, NE
Klaiber, W, CCEE
Kostic, N, Chem
Larock, R, Chem
Larson, B, CNDE
Legend Technical Services, MN
Levin, E, Ames Lab
Lin, V, Chem
Lockheed Martin, TX
Lograsso, T, Ames Lab
Lograsso, T, ICAP CA
Lograsso, T, IPRT CA
Lohnes, R, CCEE
Mallapragada, S, Chem E
McGee, T, MSE
Mid-west Environmental Service, IA
Miller, G, Ames Lab
Miller, G, Chem
Molian, P, IA
Molian, P, ME
Napolitano, R, Ames Lab
Narasimhan, B, Chem E
Nebraska Ash, NE
North Star Steel, IA
Norton, G, CSET
Nova Tech, NE
Particle Technology, IL
PMX, IA
Pure Fishing, IA
Salapaka, M, EE
Sauer-Danfoss, IA

Schlorholtz, S, CCEE
Shanks, B, Chem E
Shinar, J, Ames Lab
South Dakota State University, SD
Spry, P, GAS
Sritharan, S, CCEE
Sung, S, CCEE
Tan, X, MSE
Thompson, M, Agronomy
Trivedi, R, IPRT
US Filter, IA
Van Riessen, G, MO
Vigil, D, Chem E
Wandling Engineering, IA
Wang, K, CCEE
Weber, R, ECPE
Wheelock, T, CSET
White, D, CCEE

Structures Lab

American Athletics Inc.
Center for Industrial Research & Service, CIRAS
Dayton Superior Corp.
Federal Highway Administration
Forest Products Laboratory
Iowa Department of Transportation
Mastercraft
MGPS, Inc.
National Science Foundation, NSF

Partnerships

	Adv. Counsel	Coop Intern	Research	Prof. Exch	Gifts	Course Offerings	Recruit of Grads	Alumni Leaders	Scholar-ships
ACI	X	X			X		X	X	
APAI (Asphalt)		X			X		X	X	
APWA		X							X
ASCE							X		X
Burns & McDonald					X		X	X	X
Cedar Valley Corp	X	X			X		X	X	
Eby Const	X	X					X		
EFCO	X	X			X		X	X	
Estes		X		X		X	X		
Fox Engineering	X	X		X	X		X	X	
HCB	X	X	X	X	X		X	X	
HNTB					X		X	X	
IA DOT	X	X	X				X	X	
IA Geographic Info 1			X	X					
ICEA		X	X				X		X
ICPA		X	X				X		X
Iowa DNR	X		X						
ISU 4-H			X	X					
Kiewit	X						X		
M. A. Mortenson	X	X			X		X	X	
Manatts	X	X							
Master Builders			X	X	X	X		X	
NECA	X	X	X		X	X	X		
PCI	X	X			X		X	X	
Pepper	X	X	X		X		X	X	
Story Const	X	X		X	X		X	X	
Taylor Ball	X	X		X	X		X	X	
Terracon	X	X	X		X		X	X	
Thompson Electric	X	X		X	X		X		
Waldinger	X	X			X		X	X	
Weitz	X	X	X	X	X	X	X	X	
Western Summit		X	X		X		X	X	

International Activities, Academic Year 2004

Country	Activity	Faculty
England	Research presentation, 6th International Symposium on Pavements Unbound (UNBAR 6), Nottingham, England, July 6-8, 2004	Ceylan
Turkey	Research Presentation, 6th International Symposium on Pavements Unbound (UNBAR 6), Nottingham Centre for Pavement Engineering, School of Civil Engineering, University of Nottingham, Nottingham, England, July 6-8, 2004	Ceylan
Turkey	Research Presentation, 5th International CROW Workshop on Fundamental Modeling of the Design and Performance of Concrete Pavements Istanbul, Turkey, March 30-April 2, 2004	Ceylan
Turkey	Short Course on "Concrete Pavements: From Design to Long Term Performance," Turkish Ministry of Highways, Turkish Cement Manufacturers Association, and Turkish Ready Mix Concrete Association, Ankara, Turkey, December 29-30, 2004	Ceylan
China	Academic exchange	Ellis
Hungary	Collaborative proposal	Ellis
China	Articulation Agreement with Lanzhou Jiaotong University	Greimann
Georgia	Honorary Doctors' Degree, Hydro-engineering faculty, Georgian Tech. University	Gu
Germany	Present at conference	Jaselskis
Mexico	Conduct virtual project team	Jaselskis
Mexico	Xicotopec Interaction	S. Jones
Finland	Chair, International Society of Food, Agriculture & Envionmental	Khanal
Japan	Member of Scientific Comm for IABMAS '04 conference held in Kyoto; chaired session; presented paper	Klaiber

Country	Activity	Faculty
Japan	Invited presentation at Kyoto University	Klaiber
Singapore	Study Abroad Program and developing research collaboration	Ong
Canada	Co-Chair of International Workshop on FRP Composites for Concrete Structures (workshop sponsored by NSF, ACI, ISIS of Canada – workshop held in San Francisco, CA)	Porter
India	Keynote presentation at Geotechnical Conference	Sharma
London	Telford Medal at Institution of Civil Engineers	Sharma
Mexico	Xicotopec Interaction	Sirotiak
Slovenia	Invited participant in the US-Slovenia Workshop on performance based seismic design	Sritharan
Taiwawn	Advisory panel member for Center for Environmental, Safety and Health Technology at Industrial Technology Research Institute	Sung
Australia	Joint research with a private lab “Provisor” in Adelaide	van Leeuwen
Australia	Serving as the exchange coordinator	van Leeuwen
General	Created the course ENGR320 International Experience Report	van Leeuwen
New Zealand	Initiating an exchange program at the University of Auckland	van Leeuwen
Republic of Georgia	Advisory role to a project at a university	van Leeuwen
China	International workshop and conference	Wang
India	International workshop and conference	Wang
Netherlands	Consulted for Ed. Züblin, AG, Conducted Ko Stepped Blade tests in Rotterdam, Netherlands to measure in situ lateral stress next to diaphragm wall as part of new subway tunnel	White

Country	Activity	Faculty
Australia	Meeting and Presentation at the Technical University of Sydney	Wipf
Australia	Meeting with VicRoads (federal transportation agency) and several bridge engineeiring consulting firms	Wipf
Japan	Three papers presented at International Bridge Engineering Conference	Wipf
Scotland	Met with Civil Engineering faculty/staff/students at the University of Edinburgh as part of role as Exchange Program leader at ISU	Wipf

Inter/national Leadership Positions, Calendar Year 2004

Position	Faculty
Chair, LTPP Distress & Profile Expert Task Group	Cable
Organizing Committee, ASCE 2005 Pavement Specialty Conference, Atlanta, Georgia, November 13-16, 2005.	Ceylan
Session Chair, "Civil Engineering Applications – I," ANNIE 2004, Artificial Neural Networks in Engineering, St. Louis, Missouri, November 7-10, 2004.	Ceylan
Session Chair, "Civil Engineering Applications – II," ANNIE 2004, Artificial Neural Networks in Engineering, St. Louis, Missouri, November 7-10, 2004.	Ceylan
Session Chair, "Session 720 – Applications of Nontraditional Computing," Sponsored by Modeling Techniques in Geomechanics Committee, AFS50 (A2K05), Transportation Research Board, National Research Council, Washington D.C., January 10-14, 2004.	Ceylan
Session Chair, "Technical Session 3: Laboratory Testing," 6th International Symposium on Pavements Unbound – (UNBAR 6), Nottingham Centre for Pavement Engineering, School of Civil Engineering, University of Nottingham, Nottingham, England, July 6-8, 2004.	Ceylan
Session Organizer – Call for Papers, "Computational Intelligence Applications in Civil Engineering," ANNIE 2004, Artificial Neural Networks in Engineering, St. Louis, Missouri, November 7-10, 2004.	Ceylan
Session Organizer – Call for Papers, "Efficiency in Geotechnical Design: Neural Networks and Other Nontraditional Computing Methods," Sponsored by Subcommittee on Applications of Nontraditional Computing Tools Including Neural Nets, AFS50(1) [A2K05(1)], Transportation Research Board, National Research Council, Washington D.C., January 9-13, 2005.	Ceylan
Session Organizer – Call for Papers, "Transportation and Geotechnical Applications of Neural Networks and Other Nontraditional Computing Tools," Sponsored by Subcommittee on Applications of Nontraditional Computing Tools Including Neural Nets, AFS50(1) [A2K05(1)], Transportation Research Board, National Research Council, Washington D.C., January 10-14, 2004.	Ceylan
Session/Track Organizer – Call for Papers, "Geotechnical Challenges of Today's Pavement Design and Construction," ASCE 2005 Pavement Specialty Conference, Atlanta, Georgia, November 13-16, 2005.	Ceylan
Chair, Water Environment Research, Activated Sludge Literature Review Committee	Ellis
Chair: On- and Off-Road Mobiles Sources (ET-1), Air and Waste Management Association, 2001-2004	Hallmark

Position	Faculty
Chair: Subcommittee on Project Level Air Quality Analysis, Subcommittee of ADC20(2), Transportation and Air Quality, Transportation Research Board, National Research Council, 2001-present	Hallmark
Vice-Chair, Transportation Division (ET) (oversees transportation committees), Air and Waste Management Association, 2004-present	Hallmark
Editor, ASCE Journal of Construction Engineering and Management	Jaselskis
ASCE Vice Chair Hazardous Waste Committee	Ong
Chair, Council of Institute Leaders, ASCE	Porter
Co-Chair of ACI Committee 440-D Research of FRP Composites for Concrete Structures	Porter
Executive Committee Member, ASCE	Porter
President, The Masonry Society	Porter
Chair, ASCE GeoInstitute Soil Improvement Committee	Schaefer
Chair, ASCE Committee on Transportation Planning and Economics, Transportation and Development Institute	Souleyrette
Secretary, TRB Committee A5015, Spatial Data and Information Sciences	Souleyrette
Organizer and Chair, Technical Session on Seismic Assessment and Retrofit of Concrete Bridges, 2004 ACI Spring Convention	Sritharan
Secretary, Committee 341, American Concrete Institute (ACI)	Sritharan
Program Chair, 2004 International Association for Business and Society meetings	Strong
Vice President for International Association for Business and Society	Strong
Committee Member of International Conference on Advances in Concrete and Structures	Wang
Organizing Chair, International Workshop on Sustainable Development and Concrete Technology, China	Wang

APPENDIX D
National Comparisons

Productivity Comparison
Academic Year 2004
LAND GRANT ELEVEN

University	FTE	BS Degrees	Grad* Enroll	MS Degrees	PhD Degrees	$1000** Research
U of Arizona	13	38	50	8	4	1,126
California-Davis	25	83	191	30	15	11,000
Illinois-Urbana	47	128	394	114	19	12,990
Iowa State	30	139	142	28	3	8,680
Michigan State	20	92	75	17	5	3,500
Univ Minnesota	33	94	160	33	8	4,260
North Carolina State	35	124	182	55	15	11,833
Ohio State	35	87	126	18	2	5,171
Purdue	54	122	271	73	28	25,726
Texas A&M	53	157	336	90	16	61,937
Wisconsin-Madison	28	63	168	21	16	11,701

TOP TWELVE

University	FTE	BS Degrees	Grad* Enroll	MS Degrees	PhD Degrees	$1000** Research
California-Berkeley	43	66	334	149	30	15,894
Colorado-Boulder	33	49	249	49	22	7,560
Georgia Tech	47	121	172	68	13	N/A
Illinois-Urbana	47	128	394	114	19	12,990
Iowa State	30	139	142	28	3	8,680
Missouri-Rolla	23	71	68	46	9	3,663
North Carolina State	35	124	182	55	15	11,833
Penn State	30	154	101	34	4	10,947
Purdue	54	122	271	73	28	25,726
Texas A&M	53	157	336	90	16	61,937
Virginia Polytechnic	40	109	280	88	14	18,575
U Washington	26	77	143	40	6	9,057
Wisconsin-Madison	28	63	137	21	16	11,707

* Full time only; **External only

Productivity/FTE Comparison
Academic Year 2004
LAND GRANT ELEVEN

University	B.S. Degree	Grad Enroll	Grad Degree	Research Dollars
U of Arizona	2.92	3.85	0.92	87
California-Davis	3.32	7.64	1.80	440
Illinois-Urbana	2.72	8.38	2.83	276
Iowa State	4.63	4.73	1.03	289
Michigan State	4.60	3.75	1.10	175
Univ Minnesota	2.85	4.85	1.24	129
North Carolina State	3.54	5.20	2.00	338
Ohio State	2.49	3.60	0.57	148
Purdue	2.26	5.02	1.87	476
Texas A&M	2.96	6.34	2.00	1,169
Wisconsin	2.25	6.00	1.32	418
Average	3.14	5.40	1.52	359

TOP TWELVE

University	B.S. Degree	Grad Enroll	Grad Degree	Research Dollars
California-Berkeley	1.53	7.77	4.16	370
Colorado-Boulder	1.48	7.55	2.15	229
Georgia Tech	2.57	3.66	1.72	N/A
Illinois-Urbana	2.72	8.38	2.83	276
Iowa State	4.63	4.73	1.03	289
Missouri-Rolla	3.09	2.96	2.39	159
North Carolina State	3.54	5.20	2.00	338
Penn State	5.13	3.37	1.27	365
Purdue	2.26	5.02	1.87	476
Texas A&M	2.96	6.34	2.00	1,169
Virginia Polytechnic	2.73	7.00	2.55	464
U Washington	2.96	5.50	1.77	348
Wisconsin	2.25	4.89	1.32	418
Average	2.91	5.57	2.08	409

Productivity/FTE Comparison
Annual Averages
LAND GRANT ELEVEN

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
BS Degree/FTE	3.17 (3.36)	4.46 (4.22)	3.39 (3.75)	4.72 (3.49)	4.14 (3.44)	3.95 (3.34)	4.37 (3.00)	4.21 (3.02)	4.87 (3.29)	4.63 (3.14)
Grad Enroll/FTE	3.71 (5.21)	3.49 (5.35)	3.61 (5.44)	3.47 (4.61)	2.91 (4.42)	2.95 (5.02)	3.40 (4.94)	3.97 (5.13)	4.23 (5.07)	4.73 (5.40)
Grad Degrees/FTE	1.2 (1.81)	0.86 (1.45)	1.28 (1.69)	1.25 (1.60)	1.26 (1.72)	0.95 (1.76)	1.03 (1.49)	1.41 (1.53)	0.97 (1.51)	1.03 (1.52)
Research $1000/FTE	198 (193)	208 (169)	154 (194)	180 (206)	170 (232)	175 (280)	209 (265)	241 (312)	261 (352)	289 (359)

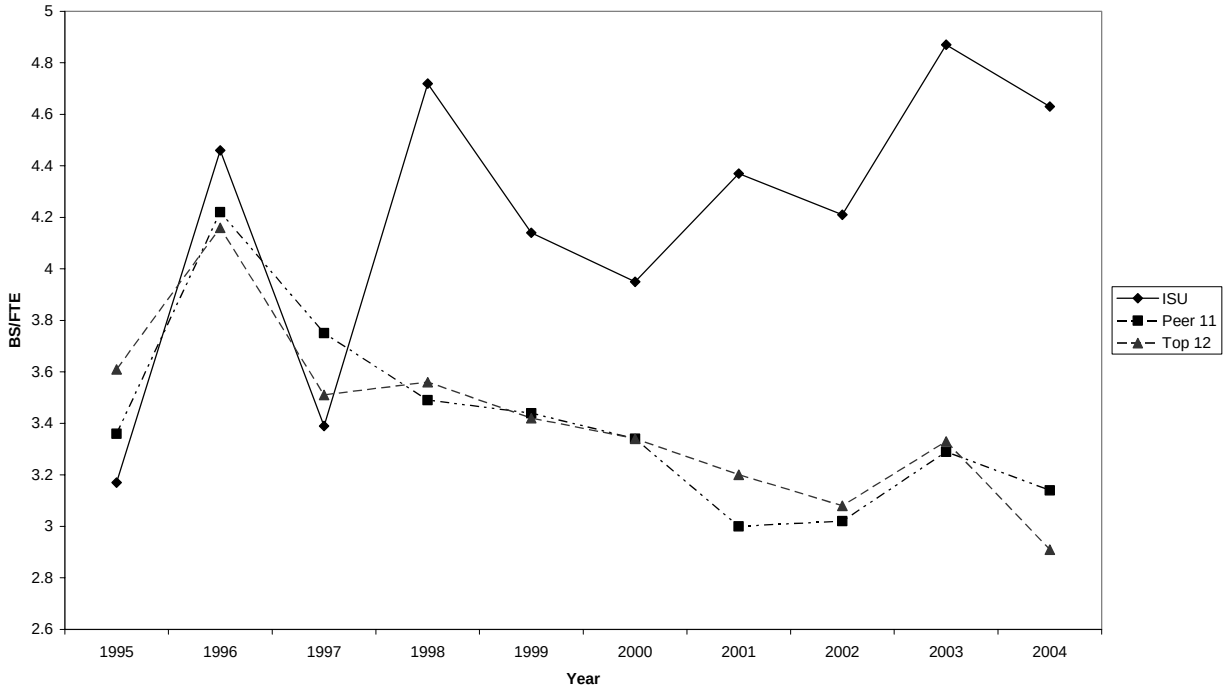
ISU (Land Grand Eleven average)

TOP TWELVE

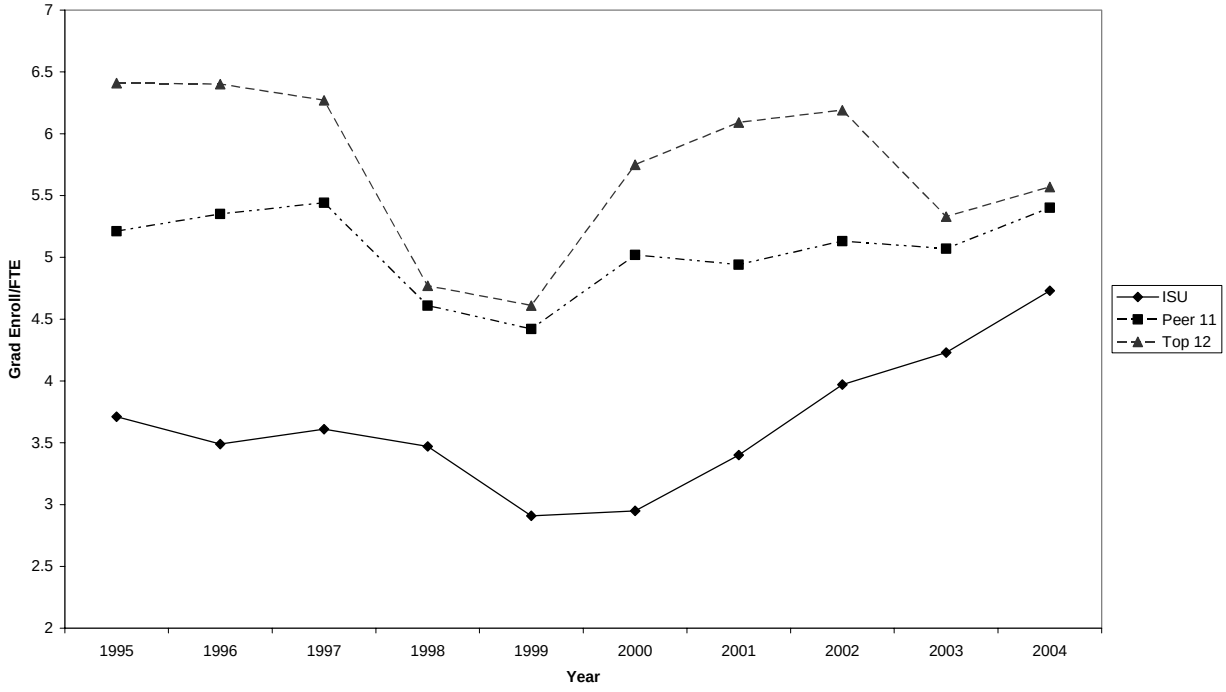
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
BS Degree/FTE	3.17 (3.61)	4.46 (4.16)	3.39 (3.51)	4.72 (4.40)	4.14 (3.42)	3.95 (3.34)	4.37 (3.20)	4.21 (3.08)	4.87 (3.33)	4.63 (2.91)
Grad Enroll/FTE	3.71 (6.41)	3.49 (6.40)	3.61 (6.27)	3.47 (4.77)	2.91 (4.61)	2.95 (5.78)	3.40 (6.09)	3.97 (6.19)	4.23 (5.33)	4.73 (5.57)
Grad Degrees/FTE	1.2 (2.37)	0.86 (2.13)	1.28 (2.19)	1.25 (1.90)	1.26 (2.11)	0.95 (2.14)	1.03 (2.06)	1.41 (2.07)	0.97 (2.34)	1.03 (2.08)
Research $1000/FTE	198 (201)	208 (168)	154 (200)	180 (206)	170 (213)	175 (257)	209 (312)	241 (347)	261 (398)	289 (409)

ISU (Top Twelve average)

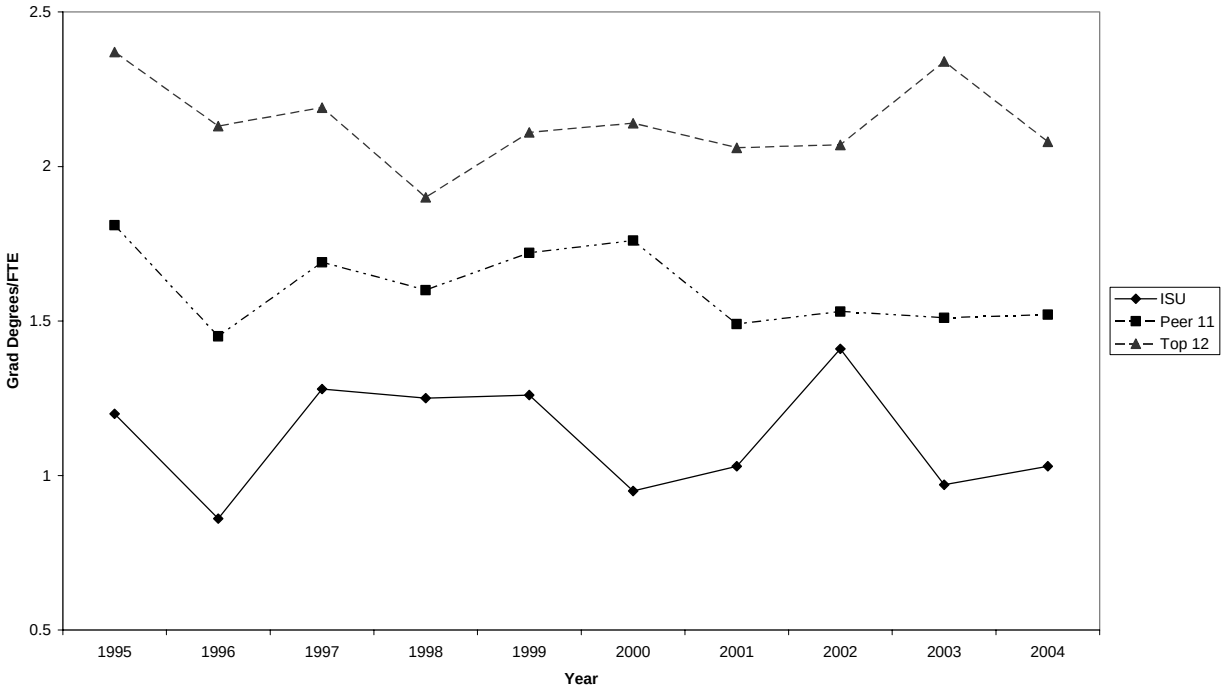
BS Degree/FTE



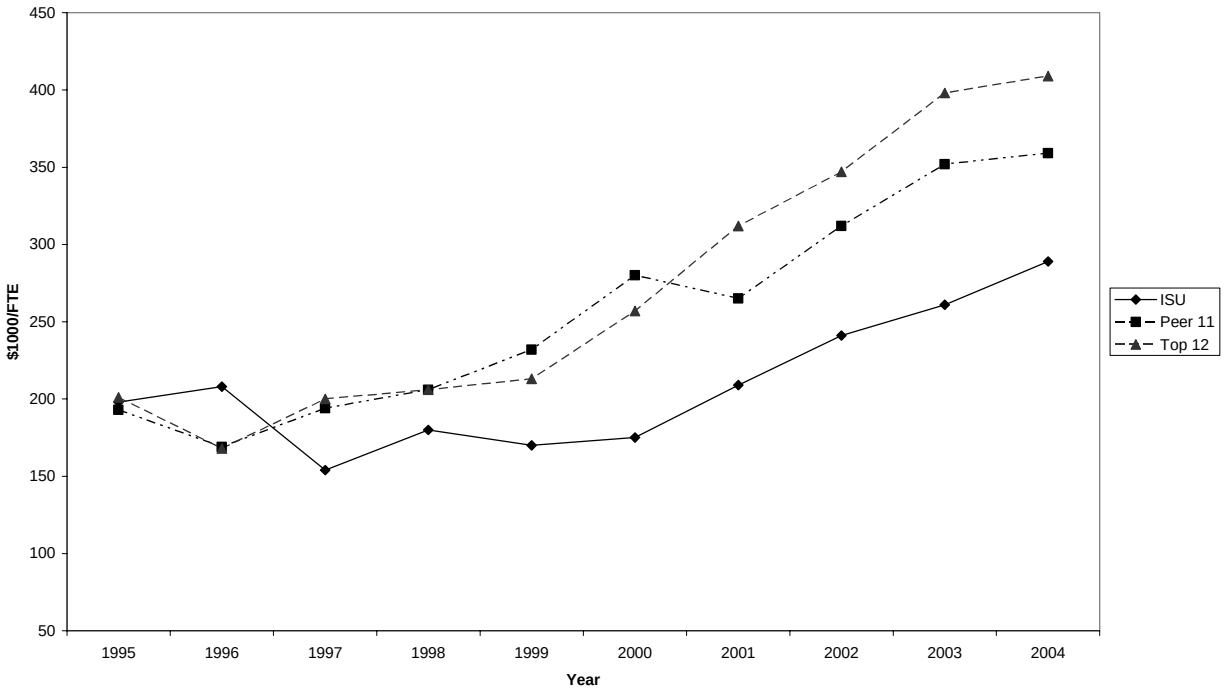
Grad Enrollment/FTE



Grad Degrees/FTE



Research $/FTE



Civil Engineering Master's Degree Enrollment, Fall 2002

(Published by ASCE, 2004)

Rank	School	Full-Time Enrollment
1	University of California, Berkeley	174
2	Texas A&M	166
3	University of Texas, Austin	154
4	Massachusetts Institute of Technology	142
5	University of Illinois, Urbana Champaign	138
5	Virginia Polytechnic	138
7	Stanford	136
8	Purdue	116
9	University of Minnesota	114
10	University of Southern California	113
11	University of Colorado, Boulder	101
12	University of Florida	100
13	North Carolina State University, Raleigh	83
14	University of Washington	81
15	Wayne State University	75
16	Cornell University	72
16	**Iowa State University**	**72**
18	Georgia Institute of Technology	69
19	University of Texas, Arlington	67
20	University of California, Davis	64
20	University of Puerto Rico	64
22	Brigham Young University	62
22	University of Maryland, College Park	62
24	Florida International University	59

Civil Engineering Doctorate Degree Enrollment, Fall 2002

(Published by ASCE, 2004)

Rank	School	Full-Time Enrollment
1	University of California, Berkeley	190
2	Purdue University	161
3	University of Illinois, Urbana-Champaign	141
4	University of Texas, Austin	114
5	Georgia Institute of Technology	108
6	Massachusetts Institute of Technology	95
7	Texas A&M University	90
8	University of California, Los Angeles	89
9	North Carolina State University, Raleigh	82
10	Stanford	78
11	Northwestern University	75
12	University of Wisconsin, Madison	74
13	University of California, Davis	73
14	University of Florida	72
14	State University of New York, Buffalo	72
16	University of Maryland, College Park	68
17	University of Colorado, Boulder	64
17	University of Washington	64
19	Virginia Polytechnic	61
20	University of Minnesota	57
26	**Iowa State University**	**41**
26	University of Missouri, Rolla	41

2003 Bachelor's Degrees in Civil Engineering
Academic Year 2002-03
(Published by ASCE, 2004)

Rank	School	# of Degrees	Last Year # Degrees
1	Texas A&M University	181	133
2	Purdue University	170	168
3	Penn State University	167	206
4	North Carolina State University, Raleigh	161	117
5	Polytechnic University of Puerto Rico	158	140
6	**Iowa State University**	**151**	**131**
7	University of Puerto Rico	135	143
8	University of Nebraska, Lincoln	127	104
9	Brigham Young University, Idaho	122	
10	University of Illinois, Urbana-Champaign	115	145
11	Virginia Polytechnic Institute	109	187
12	Oregon State University	108	89
13	Georgia Institute of Tech	105	125
14	North Dakota State University	103	70
15	Washington State University	101	85
16	Michigan State University	100	73
17	Michigan Tech University	92	110
18	Cooper Union	89	13
18	Clemson University	89	87
20	University of Florida	88	96

Note: 222 schools reporting; ISU in top 3%.

2003 Master's Degrees in Civil Engineering, Academic Year 2002-03

(Published by ASCE, 2004)

Rank	School	# of Degrees	Last Year # Degrees
1	University of California, Berkeley	181	151
2	Massachusetts Institute of Technology	128	112
3	Stanford University	117	101
4	University of Illinois, Urbana-Champaign	97	65
5	Purdue University	92	74
6	Georgia Institute of Technology	89	74
7	University of Texas, Austin	88	76
8	Virginia Polytechnic Institute	87	70
9	Texas A&M University	69	61
10	North Carolina State University, Raleigh	67	59
11	University of Florida	63	57
11	Cornell University	63	51
13	University of Washington	60	69
14	University of Colorado, Boulder	59	73
15	Northeastern University	51	47
16	University of Minnesota	50	28
17	Stevens Institute of Technology	48	25
18	State University of New York (SUNY), Buffalo	45	42
19	University of Southern California	43	44
19	Florida International University	43	12
19	University of Wisconsin, Madison	43	33
22	Utah State University	42	20
23	University of Michigan, Ann Arbor	39	39
24	Brigham Young University	38	35
25	University of Missouri, Rolla	19	53
37	**Iowa State University**	**28**	**27**

Note: 172 schools reporting; ISU in top 22%.

2003 Doctorate Degrees in Civil Engineering, Academic Year 2002-03

(Published by ASCE, 2004)

Rank	School	# of Degrees	Last Year # Degrees
1	University of California, Berkeley	38	21
2	University of Texas, Austin	26	27
3	Massachusetts Institute of Technology	24	21
4	Purdue University	23	24
5	University of Colorado, Boulder	22	19
6	North Carolina State University, Raleigh	18	16
7	Stanford University	17	14
8	Texas A&M University	17	16
9	University of Wisconsin, Madison	17	13
10	Arizona State University	13	5
11	University of Illinois, Urbana Champaign	13	28
12	Virginia Polytechnic Institute	13	17
13	University of California, Davis	12	11
14	Georgia Institute of Technology	12	15
15	University of Southern California	11	2
16	Colorado State University	11	8
17	Northwestern University	11	13
18	Princeton University	10	11
19	University of California, Irvine	9	4
20	University of Maryland, College Park	9	8
21	State University of New York (SUNY), Buffalo	9	9
22	Lehigh University	9	3
23	Penn State University	9	3
24	Cornell University	8	
25	Carnegie Mellon University	8	7
65	**Iowa State University**	**2**	**4**

Note: 102 schools reporting; ISU in third quartile (64%).

U.S. News & World Report, 2005 Rankings (published 2004)
Civil Engineering Specialty, Schools with Ph.D. Program

Peer 11	Undergraduate Rank (out of 126 schools)	Graduate Rank (out of 74 schools)
Univ. Illinois, Champaign	1	2
Purdue	6	7
Texas A&M	9	14
Univ. Minnesota	16	12
Univ. California, Davis	16	15
North Carolina State	19	23
Univ. Wisconsin, Madison	21	18
Iowa State University	Not ranked	28
University of Arizona	Not ranked	38
Michigan State University	Not ranked	38
Ohio State	Not ranked	34

Engineering Programs, 2005 Rankings (published 2004)

Peer 11	Undergraduate Rank (out of 126 schools)	Graduate Rank (out of 87 schools)
Univ. Illinois, Champaign	4	4
Purdue	8	8
Univ. Wisconsin, Madison	13	14
Texas A&M	16	14
Univ. Minnesota	19	26
Ohio State	28	29
Univ. California, Davis	28	37
North Carolina State	33	33
Iowa State University	33	46
Michigan State University	39	56
University of Arizona	39	47

U.S. News & World Report, September 2004
Top 20 Civil Engineering Graduate Programs

Rank	University	FTE	BS Degrees	MS Degrees	PhD Degrees	$1000* Research	BS/ FTE	MS/ FTE	PHD/ FTE	$/FTE	Grad Admiss Denial	Full-time Masters Enroll	Full-time Doctorate Enroll
1	California-Berkeley	43	69	149	30	15,894	1.6	3.5	0.7	369.6	83.8%	152	182
2	Illinois-Urbana	47	128	132	24	12,997	2.7	2.8	0.5	276.5	82.2%	185	209
3	Stanford	26	11	114	29	12,325	0.4	4.4	1.1	474.0	64.5%	154	72
3	Texas-Austin[1]	48	69	94	30	32,176	1.4	2.0	0.6	670.3	74.8%	193	137
5	Georgia Inst of Tech	47	121	83	21		2.6	1.8	0.4		68.4%	67	105
5	Massachusetts Inst of Tech	34	16	113	14	11,228	0.5	3.3	0.4	330.2	74.7%	106	96
7	Purdue-W. Lafayette	54	122	73	28	25,726	2.3	1.4	0.5	476.4	69.9%	72	199
7	Michigan-Ann Arbor	25	52	55	9	4,528	2.1	2.2	0.4	181.1	63.1%	61	67
9	California Inst of Tech[2]	11					0.0	0.0	0.0	0.0			
9	Northwestern	20	20	20	12		1.0	1.0	0.6	0.0	73.5%	25	64
11	Cornell	26	53	51	8	4,905	2.0	2.0	0.3		75.2%	59	62
12	Carnegie Mellon Univ	15	22	25	6	2,669	1.5	1.7	0.4	177.9	77.4%	32	29
12	Minnesota-Twin Cities	33	94	33	8	4,260	2.8	1.0	0.2	129.1	62.2%	83	53
14	Texas A&M-College Station	53	157	90	16	61,937	3.0	1.7	0.3	1168.6	62.7%	207	129
15	California-Davis	25	83	30	15	11,000	3.3	1.2	0.6	440.0	72.3%	93	98
15	Washington	26	77	40	6	9,057	3.0	1.5	0.2	348.3	69.7%	118	25
15	Virginia Tech	40	109	88	14	18,575	2.7	2.2	0.4	464.4	75.6%	185	95
18	Penn State Univ	30	154	34	4	10,947	5.1	1.1	0.1	364.9	73.2%	46	55
18	Wisconsin-Madison	28	63	21	16	11,701	2.3	0.8	0.6	417.9	75.2%	62	75
20	Princeton	13	23	7	3	2,313	1.8	0.5	0.2	177.9	81.9%	9	31
20	Colorado-Boulder	33	49	49	22	7,560	1.5	1.5	0.7	229.1	13.3%	161	88
28	Iowa State University	30	139	28	3	8,680	4.6	0.9	0.1	289.3	82.1%	88	54
	Average	32.1	77.7	63.3	15.1	14,130.4	2.2	1.7	0.4	349.3	77.5%	102.8	91.7

*External only

[1]Research dollars reported include research funding from eight centers.

[2]Civil Engineering program is graduate level only. No data reported.

Productivity Comparison - *U.S. News & World Report* Ranking Data
Academic Year 2004

Items	ISU	Top 20 Average	#20 (CO-Boulder)	#9 (Northwestern)	Minnesota	Wisconsin
Graduate student denial rate (for College of Engineering)	82.1%	71.7%	7.7%	73%	62%	75%
PhD students/faculty FTE	1.7	2.9	2.7	3.2	1.6	2.7
MS students/faculty FTE	2.9	3.2	4.9	1.3	2.5	2.2
PhD degrees	3.0	15.1	22.0	12.0	8.0	16.0
Total research dollars	8,680	14,130	7,560	0	4,260	11,701
Research/faculty FTE	289	349	229	0	129	418
BS degrees/FTE	4.6	2.2	1.5	1.0	2.8	2.3
MS degrees/FTE	0.9	1.7	1.5	1.0	1.0	0.8
PhD degrees/FTE	0.1	0.4	0.7	0.6	0.2	0.6

National Research Council Report
"Scholarly Quality of Program" 1995

Peer 11	Rank (out of 86 schools)
University of Arizona	34
Univ. California, Davis	16
Univ. Illinois, Champaign	5
Iowa State University	45.5
Michigan State University	41
Univ. Minnesota	13
North Carolina State	30
Ohio State	40
Purdue	11
Texas A&M	17.5
Univ. Wisconsin, Madison	22
Average	**25**

Top Twelve	Rank (out of 86 schools)
Univ. California, Berkeley	2
Univ. Colorado, Boulder	24
Univ. Illinois, Champaign	5
Iowa State University	45.5
Univ. Missouri, Rolla	60
North Carolina State	30
Penn State	32
Purdue	11
Texas A&M	17.5
Virginia Polytechnic	19.5
Univ. Washington	14
Univ. Wisconsin, Madison	22
Average	**24**

Undergraduate Civil Engineering Program
Gourman Report Ranking

Date	Edition	CE Rank	CE Score	ConE Score	# of Engr. Programs Evaluated	Overall ISU Score
1983	4th	27	3.90		230	4.28
1985	5th	26	3.90		193	4.29
1987	6th	26	4.43	4.69	199	4.29
1989	7th	26	4.43	4.69	204	4.29
1993	8th	27	4.43	4.69	200	4.29
1996	9th	27	4.42		144	4.30
1998	10th	27	4.42		144	4.30

Rating Categories	Numerical Range
Strong	4.41-4.99
Good	4.01-4.40
Acceptable Plus	3.51-3.99
Adequate	3.01-3.50
Marginal	2.01-2.99

Gourman, Jack, *The Gourman Report. A Rating of Undergraduate Programs in American and International Universities*.

APPENDIX E
Abstracts

Abendroth, R. E., *Iowa Department of Transportation, Iowa Highway Research Board,* 1/1/99-4/30/04, $178,358, "**Steel Diaphragms in Prestressed Concrete Girder Bridges."**

Over the years, bridge engineers have been concerned about the response of PC girder bridges that are struck by over-height vehicles. When impacts occur, usually the outside and in some instances one of the interior bridge girders are damaged. Bridge engineers with the Iowa DOT believe an intermediate RC diaphragm offers greater protection than that provided by an intermediate steel channel diaphragm against PC girder damage. Intermediate diaphragms for PC girder bridges provide stability to the girders during bridge construction, contribute to the lateral distribution of vertical wheel loads that are applied to the bridge deck of multi-girder bridges, and help to distribute lateral impact forces from over-height vehicles. Research needs to be conducted to establish the behavior of intermediate diaphragms in PC girder bridges that are subject to lateral loads. The proposed research will establish whether an intermediate structural steel diaphragm with simple connections to the PC girders will provide essentially the same degree of PC girder protection as that provided by the intermediate RC diaphragms currently being used by the Iowa DOT. This research will be an analytical study that involves extensive and detailed finite-element modeling. (Administered by Center for Transportation Research and Education)

Abendroth, R. E., *Iowa Department of Transportation, Iowa Highway Research Board,* 7/1/99-6/30/04, $142,903, "**An Integral Abutment Bridge with Precast Concrete Piles."**

Previous integral-abutment bridge research by ISU research teams has addressed the investigation of bridges supported by structural steel, HP-shaped, abutment piles. The Tama County bridge will be the first integral-abutment bridge with PC piles to be constructed in Iowa. Limited information is available on the performance of integral-abutment bridge supported with this type of pile. To investigate the performance characteristics of the PC piles in the Tama County bridge, the proposed research will include a field-monitoring program for this bridge to measure displacements and rotations of the bridge abutments; to record strains in selected PC abutment piles; and to visually inspect the selected piles for indications of distress caused by expansion and contraction of the bridge. (Administered by Center for Transportation Research and Education)

Andrle, S. J., *Iowa Department of Transportation,* 1/1/01-12/31/03, $3,161, **"Conducting Introductory Literature Searches for the Iowa Research Board."**

The objective of this project is to provide the Iowa Highway Research Board (IHRB) with a listing of research reports relevant to a proposed IHRB study, a listing of research in progress elsewhere, and a brief report recommending a course of action by the IHRB.

Andrle, S. J., *Iowa Department of Transportation,* 10/1/03-12/31/03, $21,003, **"Coordination of Transit and School Busing in Iowa**."

The 2003 Iowa General Assembly asked the Iowa Department of Transportation (Iowa DOT) to conduct a study of Iowa public policy regarding coordination of public transit services and school transportation. This report describes the efficiencies that may be obtained by coordinating transit management and maintenance systems in the areas of school transportation, public transit, and other

forms of public transportation. As requested by the Iowa DOT, the Center for Transportation Research and Education (CTRE) at Iowa State University studied these issues and prepared this report. CTRE conducted a survey of the 35 transit agencies in Iowa and school districts served by public transit agencies to determine the extent and nature of coordination. Twenty-three transit agencies coordinate in some manner with over 45 school districts. The nature of the coordination varies with the urban or rural nature of the area. The results of the study show that Iowa policy is supportive of coordination activities, coordination occurs when there is clear benefit to both parties, coordination can result in efficiencies and cost savings, and the safety records of school bus and public transit in Iowa are both excellent and comparable. (Administered by Center for Transportation Research and Education)

Andrle, S. J., *Federal Highway Administration/Iowa Department of Transportation,* 12/1/02-8/31/03, **"Deploying the Maintenance Decision Support System (MDSS) in Iowa**."

Adverse weather conditions dramatically affect the nation's surface transportation system. The development of a prototype winter Maintenance Decision Support System (MDSS) is part of the Federal Highway Administration's effort to produce a prototype tool for decision support to winter road maintenance managers to help make the highways safer for the traveling public. The MDSS is based on leading diagnostic and prognostic weather research capabilities and road condition algorithms, which are being developed at national research centers. In 2003, the Iowa Department of Transportation was chosen as a field test bed for the continuing development of this important research program. The Center for Transportation Research and Education assisted the Iowa Department of Transportation by collecting and analyzing surface condition data. The Federal Highway Administration also selected five national research centers to participate in the development of the prototype MDSS. It is anticipated that components of the prototype MDSS system developed by this project will ultimately be deployed by road-operating agencies, including state departments of transportation, and generally supplied by private vendors.

Andrle, S. J., *Iowa Department of Transportation,* 5/15/02-5/31/04, $10,000, **"Develop a Scope for a Center for Winter Highway Maintenance."**

Andrle, S. J., Jaselskis, E. J., & Walters, R. C. *Iowa Department of Transportation/Iowa Highway Research Board,* 10/1/02-5/31/04, $124,998, **"Development of Object-oriented Specifications for Iowa DOT and Urban Standards."**

Object-oriented-CAD (OO-CAD) systems have long been touted as the way forward for more intelligent CAD systems. In an object-oriented design, the object contains all of the data necessary to fully describe that object. The idea behind this concept is that the design involves several objects that have information associated with them. When the user clicks on an object, information pertaining to that object appears. This information can be fixed or dynamic in a sense that the information about that object changes with time. Only a few OO-CAD systems have been previously developed—mostly on high-end Unix machines, which are not affordable by the majority of practitioners in the construction industry. This appears to be changing with the introduction of OO components in many of the popular systems (e.g., AutoCAD with

objects defined in C++) (Object Oriented CAD, 1997). Major CAD packages such as AutoCAD and Microstation are presently working toward greater interoperability in the Windows environment by supporting such emerging tools as aecXML (Architect/Engineer/Contractor eXtensible Markup Language) (Longworth, 1997). Other object-oriented animation programs such as Flash and Shockwave are also available. The purpose of this research project is to pilot test this idea and assess its impact on the design and construction of transportation projects. It is anticipated that some specifications (Iowa DOT and urban) will be included in an object-oriented format to demonstrate the concept. The research team plans to build on the current work related to the Electronic Reference Library since this is already in a useable format for this pilot project. In a sense, the end product will be a graphical or visual front-end system for the ERL. Full-scale development and maintenance issues will be addressed as part of this project.

Andrle, S. J., *Iowa Department of Transportation*, 1/1/02-12/31/03, $40,000, **"Half Percent Safety Program."**

Andrle, S. J., *Iowa Department of Transportation*, 06/01/01-12/31/04, $72,095, **"Iowa Transit ITS Needs Analysis Phase I and II."**

The objectives of this project are to identify the ITS needs of transit agencies, develop a statewide transit architecture consistent with the state and national architecture, and produce a deployment plan that will identify the costs and benefits of implementing and operating various ITS components and include a structured approach to deployment of ITS in transit systems.

Andrle, S. J., *Iowa Department of Transportation*, 12/1/02-8/31/03, $36,464, **"Maintenance Decision Support Systems (MDSS): Support for the Winter 2003 Field Demonstration and Evaluation Plan."**

Andrle, S. J., *Iowa Department of Transportation*, 6/21/02-9/30/03, $137,183, **"Management of the Iowa Department of Transportation Library."**

Andrle, S. J., *University of Nebraska*, 7/1/02-6/30/04, $40,233, **"Midwest States Smart Work Zone Deployment Initiative (MWSWZDI) Year 4: Effectiveness of Extra Enforcement in Construction and Maintenance Work Zones."**

Andrle, S. J., *Iowa Department of Transportation*, 6/1/02-12/31/04, $112,785, **"North American International Trade Corridor (Corridor 23): Intelligent Infrastructure Study Work Plan Support."**

The objective of this project is to provide assistance to the Iowa DOT in managing its program efforts to study the feasibility of establishing an "intelligent infrastructure" along the designated trade corridor and to deploy a pilot project.

Andrle, S. J., & Harrington, D. S., *Iowa Concrete Paving Association*, 02/10/01-06/30/04, $220,000, **"PCC Research Lab: Remodeling of Room 138 Town Engineering Building and Purchase of Lab Equipment."**

Andrle, S. J., *Innovative Pavement Research Foundation*, 6/21/01-6/20/04, $575,509, **"Program Development, Management, and Communication Services for the Concrete Pavement Technology Program (Element 1)."**

Andrle, S. J., *Iowa Concrete Paving Association*, 07/01/00-06/30/04, $144,381, **"Program Manager for PCC Pavement Technology (Amendment 1 to Addendum 1)—FY 2002."**

Andrle, S. J., *Iowa Department of Transportation,* 7/1/03-6/30/04, $10,000, "**Students Engaged in Research Activities in Areas of Interest to the Iowa DOT**."

Andrle, S. J., *Iowa Department of Transportation,* 5/20/98-6/30/05, $35,000, "**Traffic Data Collection and Reduction Using Video Detection Equipment**."

The purpose of this project is to collect video images of traffic at locations throughout the state of Iowa. The locations will be defined by the Engineering Division of the Iowa DOT. The video image collection may involve the use of one or two trailers, depending on the situation. Each trailer has two black-and-white video cameras mounted on a 30-foot pneumatic boom and two high-fidelity VHS-format videotape records. After videos of traffic are made, the videos may either be viewed and interpreted by a trained observer to allow Iowa DOT engineers to better understand traffic operations at that location or, using video image-processing technology, numerically quantify the performance of traffic flow (e.g., speed, volume, and density of traffic). All video images collected will be archived. Traffic flow performance data to be reduced from videotapes for traffic simulation modeling and traffic engineering purposes will be reduced and summarized immediately following the taping. These data will be summarized in a format appropriate for analysis. All summary data will be archived in a standard electronic format (e.g., Excel spreadsheet). (Administered by Center for Transportation Research and Education)

Austin, T. A. & Lutz, D. S., *Army Corps of Engineers, Rock Island District,* 11/28/01-12/31/2099, $110,579, **"Water Quality Study, Red Rock Reservoir."**

The Des Moines River Water Quality Network is a surface water quality project sponsored by the U.S. Army Corps of Engineers that collects water samples year-round at locations along the Des Moines and Raccoon rivers and Saylorville and Red Rock reservoirs. The purpose of the projects is to evaluate the effects of Saylorville and Red Rock dams on downstream river quality and to characterize upstream water quality. The project was initiated in 1967 as a pre-impoundment study of the Saylorville Reservoir reach and has evolved into a post-impoundment study of Saylorville and Red Rock reservoirs. The scope of work under the current research contracts specifies that over 40 parameters be quantified at 7 different sites on 22 separate occasions. The parameters examined include dissolved oxygen, pH, alkalinity, hardness, ammonia, nitrite plus nitrate, phosphate, BOD, suspended solids, chlorophyll pigments, coliform bacteria, and trace metals. Additionally, pesticide residues in fish will be examined. In addition, at Red Rock Dam water from seven groundwater monitoring wells will be characterized monthly to quantify mineral saturation indices.

Austin, T. A., & Lutz, D. S., *Army Corps of Engineers, Rock Island District,* 11/28/01-12/31/99, $111,030, "**Water Quality Study, Saylorville Reservoir."**

The Des Moines River Water Quality Network is a surface water quality project sponsored by the U.S. Army Corps of Engineers that collects water samples year-round at locations along the Des Moines and Raccoon rivers and Saylorville and Red Rock reservoirs. The purpose of the projects is to evaluate the effects of Saylorville and Red Rock dams on downstream river quality

and to characterize upstream water quality. The project was initiated in 1967 as a pre-impoundment study of the Saylorville Reservoir reach and has evolved into a post-impoundment study of Saylorville and Red Rock reservoirs. The scope of work under the current research contracts specifies that over 40 parameters be quantified at 7 different sites on 22 separate occasions. The parameters examined include dissolved oxygen, pH, alkalinity, hardness, ammonia, nitrite plus nitrate, phosphate, BOD, suspended solids, chlorophyll pigments, coliform bacteria, and trace metals. Additionally, pesticide residues in fish will be examined.

Bazylinski, D., Brown, R. C., Ellis, T. G., Fan, M., Ford, C. F., Halverson, L. J., Hargrove, M. S., Heindel, T. J., Honzatko, R., Kuo, M. L., Lin, V. S., Moore, K. J., Norton, G. A., Pohl, N., Pometto, A., Reilly, P. J., Richard, T. L., Shanks, B. H., Suby, A. A., Sung, S.-W., Van Gerpen, J. H., & **van Leeuwen, J. H.,** *U.S. Department of Agriculture,* 8/1/02-7/31/05, $3,070,292, "**Iowa Biotechnology Byproducts Consortium."**

This project aims to produce crystals of several endoglucanases (cellulases) in glycoside hydrolase Family 44 and to obtain a three-dimensional structure of at least one of them. At present there are no known structures of any enzyme from this family, and therefore how it operates is largely unknown. To increase our probability of success, we are working with three enzymes, from the aerobic spore-forming bacterium Paenibacillus lautus and the anaerobic bacteria Clostridium acetobutylicum and Ruminococcus flavifaciens. The endoglucanase from R. flavifaciens has been cloned into E. coli so that it can be produced more easily and hopefully in higher amounts. This project could greatly increase knowledge of this cellulase family, important given the high potential of cellulases to produce sugars from cellulose. (Administered by Institute for Physical Research and Technology)

Brown, R. C., & Sung, S.-W., *Department of Energy*, 05/01/00-09/30/03, $454,404, **"Biohydrogen Production from Renewable Organic Wastes."**

The goal of the proposed project is to develop an anaerobic fermentation process that converts negative value organic wastes into hydrogen-rich gas that can significantly enhance the economic viability of many processes either by utilizing hydrogen as a fuel source or as raw material for industries that consume hydrogen. The waste streams from food processing plants (such as corn, soybean, and meat) pose a major burden on the environment. Aerobic wastewater treatment usually used for the treatment of these wastes requires energy input to provide aeration, whereas an anaerobic digestion process can achieve dual benefits of energy production in the form of hydrogen or methane and waste stabilization. By using the hardware that is similar to that used in industrial methane fermentation, hydrogen could be produced at a much faster reaction rate. Additionally, hydrogen has a heating value of 61,100 Btu/lb, while methane has a heating value of 23,879 Btu/lb, nearly one third that of hydrogen. In this proposed project, fundamental and practical feasibility studies of hydrogen fermentation from negative value organic wastes will be conducted using naturally available inocula (i.e., natural soil and compost) in continuous flow bioreactors. Various selection pressures will be used to minimize contamination of the hydrogen-producing bacterial culture and avoid undesirable by-products. By selecting suitable waste streams and providing a favorable environment for the hydrogen-producers, relatively high conversion efficiencies could be maintained. Later stages of the study will use pilot-scale reactors to demonstrate the effectiveness of real wastes in hydrogen production. Industries participating in this project will use on-site demonstration units to produce hydrogen from their own wastewater. The cost efficiency of biohydrogen production

will also be evaluated. (Administered by Institute for Physical Research and Technology) Keywords: anaerobic fermentation, hydrogen production, organic waste, energy

Cable, J. K., Ceylan, H., & Fanous, F. S., *Federal Highway Administration; Iowa Department of Transportation; Iowa Highway Research Board,* 10/1/03-9/30/05, $120,179, **"Design and Construction Procedures for Concrete Overlay and Widening of Existing Pavements (TR-511)."**

The objective is to conduct a structural analysis of the overlay and widening unit contributions to stress reductions and extended pavement life of the composite pavements; develop construction guidelines for thin concrete overlays; develop overlay design procedures, and validate the structural analysis and design procedures with field load tests. (Administered by the Center for Transportation Research and Education)

Cable, J. K., *U.S. Department of* Transportation, 9/17/02-8/31/06, $197,482, "**Evaluation of Composite Pavement Unbonded Overlays: Phase III."**

Cable, J. K., *Iowa Department of Transportation/Iowa Highway Research Board*, 07/01/01-06/30/06, $20,307, **"Evaluation of Unbonded Ultrathin Whitetopping of Brick Streets."**

The purpose of this research is to evaluate the performance of an unbonded PCC overlay approximately three inches thick placed on an existing base of asphalt cement concrete and brick.

Cable, J. K., *Iowa Department of Transportation,* 07/30/98-12/31/03, $98,478, **"Field Evaluation of Alternative Load Transfer Device Locations in Low Traffic Volume Pavements."**

The project seeks to evaluate the effect of reducing the number of dowels in a low-volume pavement transverse joint. Two projects in Union County have been used to conduct the study. One rural pavement on granular base has been outfitted with 20 joints each including no dowels, three dowels, and four dowels in the outer wheel path. A similar study on a county/city street employs ten joints of each pattern and a pavement overlay of an existing asphalt roadway. The joints will be monitored for opening width, faulting, visual distress, and deflection in both wheelpaths for five years to evaluate the performance.
Key Words: dowels, load transfer, PCC pavements

Cable, J. K., & Porter, M. L., *U.S. Department of Transportation,* 8/16/02-11/30/04, $161,455, **"Field Evaluation of Elliptical FRP Dowel Performance."**

The goal of this project is the evaluation of elliptically shaped FRP dowels and basket assemblies to be installed in the field in actual highway construction projects. The size and spacing of the dowels are the major parameters, along with a comparison to the steel dowels. Some of the joints will be instrumented with strain gages placed on the dowel bars. Load tests will be performed.

Cable, J. K., *Federal Highway Administration,* 5/19/03-5/18/08, $88,156, **"Field Evaluation of Elliptical Steel Dowel Performance**."

Cable, J. K., *Federal Highway Administration,* 10/1/03-3/31/04, $11,162 "**Long Term Performance Evaluation of Concrete Pavements."**

This research will analyze existing state, county, and city route pavement records to determine what design characteristics, materials, and operational characteristics contributed to the long lasting performance of the concrete pavements that are still in operation.

Cable, J. K., *Ames Engineering; Federal Highway Administration; Gomaco; Iowa Highway Research Board; PCC Center,"* 10/1/03-12/31/04, $45,000, **"Measuring Pavement Profile at the Slip-form Paver (TR-512, Proj. 12)."**

This research will evaluate equipment and methods to measure profile being produced at the slip-form paver and by each of the various pieces of paving equipment and processes used from the deposit of the pavement concrete to the completion of the curing operation. (Administered by Center for Transportation Research and Education)

Cable, J. K., *Iowa Highway Research Board; PCC Center,* 12/1/02-2/28/04, $129,519, **"Stringless Portland Cement Concrete Paving."**

This report describes results from a study evaluating the use of stringless paving using a combination of global positioning and laser technologies. CMI and Geologic Computer Systems developed this technology and successfully implemented it on construction earthmoving and grading projects. Concrete paving is a new area for considering this technology. Fred Carlson Company agreed to test the stringless paving technology on two challenging concrete paving projects located in Washington County, Iowa. The evaluation was conducted on two paving projects during the summer of 2003. The research team from Iowa State University monitored the guidance and elevation conformance to the original design. They employed a combination of physical depth checks, surface location and elevation surveys, concrete yield checks, and a physical survey of the control stakes and string line elevations. A final check on profile of the pavement surface was accomplished by the use of the Iowa Department of Transportation Light Weight Surface Analyzer. Due to the speed of paving and the rapid changes in terrain, the laser technology was abandoned for this project. Total control of the guidance and elevation controls on the slip-form paver were moved from string line to global positioning systems (GPS). The evaluation was a success, and the results indicate that GPS control is feasible and approaching the desired goals of guidance and profile control with the use of three-dimensional design models. Further enhancements are needed in the physical features of the slip-form paver oil system controls and in the computer program for controlling elevation. (Administered by Center for Transportation Research and Education)

Cable, J. K., *Federal Highway Administration,* 10/1/03-3/31/05, $70,053, **"Two Lift Paving."**

This project will determine the location, design, construction parameters used and the current condition of the two lift construction projects in the United States and determine the research gaps and limitations that are restraining the use of this technique.

Cable, J. K., *Iowa Department of Transportation,* 07/01/99-12/31/04, $183,903**, "Ultrathin Portland Cement Concrete Overlay Extended Evaluation."**

This research will seek to extend the evaluation of a 7.2-mile ultrathin portland cement concrete pavement from five years

to ten years. In addition, it will allow the researchers to explore the potential ways to rehabilitate thin concrete pavements and understand their behavior under climate and loadings. It will also allow the researchers to better estimate the life of an ultrathin overlay rehabilitation. Some 41 test sections of asphalt concrete and portland cement will be reviewed twice per year visually and once per year in terms of deflection measurements.
Key Words: ultrathin portland cement concrete, pavements, whitetopping, fibers, concrete pavements, pavement rehabilitation

Cackler, E. T., *Iowa Department of Transportation*, 2/1/03-12/31/03, $416,354, **"Material and Construction Optimization for Prevention of Premature Pavement Distress in Portland Cement Concrete Pavements**."

Coree, B. J., *Iowa Highway Research Board*, 11/1/03-9/30/04, "**AASHTO 2002 Pavement Design Guide Implementation Plan (TR-509)**"

The AASHTO has identified the need to improve the pavement design methods currently in use that have been in place since 1962. Several factors now make these methods obsolete including traffic changes, new pavement options, and unreliability of current methods that estimate design thickness.

Coree, B. J., *Iowa Department of Transportation*; *Iowa Highway Research Board*, 8/1/02-1/31/05, $145,775, **"Evaluation of Hot Mix Asphalt Moisture Sensitivity Using Nottingham Asphalt Test Equipment."**

Current test methods of identifying sensitivity to moisture damage in hot mix asphalt mixtures are both historically unreliable, and calibrated on sample sizes and compaction methods no longer in general use. This research will develop one or more test protocols using the Superpave Gyratory Compactor and the Nottingham Asphalt Tester. These protocols will include and specifically address sample preparation, sample conditioning and testing, and recommendations as to critical acceptance criteria.

Coree, B. J., *Purdue University*, 01/01/01-08/31/03, $56,326, **"Identification of Laboratory Techniques to Optimize Superpave HMA Surface Friction Characteristics."**

Coree, B. J., *Iowa Department of Transportation*, 7/1/03-6/30/05, $41,331 **"Predicting Critical VMA in Hot Mix Asphalt Phase II."**

The objective of this project is to test common Iowa mixtures to validate and refine the conclusions and recommended VMA criterion. (Administered by Center for Transportation Research and Education)

Coree, B. J., *Iowa Highway Research Board*, 1/1/02-12/31/04, $178,197, **"Rehabilitation of Concrete Pavements Utilizing Rubblization and Crack and Seat Methods."**

The objective of this project is to study the effects of PCC rubbilization and crack-and-seat operations on the HMA overlay thickness necessary to achieve the desired design life. In order to achieve this objective, four sub-objectives will need to be addressed: (1) to determine the structural value of PCC slabs fractured by either method, (2) to examine design, construction and performance records of existing overlaid fractured PCC pavements to estimate the effects of subgrade, fractured slab thickness and structural value, and overlay thickness on performance and (4) to validate or calibrate the model using in-service

pavement performance histories and the instrumented pavements on IA141.

Doornink, J. D., & Klaiber, F. W., *National Highway Institute,* 9/1/02-9/1/03, $1,500, "**The Dwight David Eisenhower Transportation Fellowship Program: 2002 Eisenhower Graduate Fellowships**."

Ellis, T. G., & Laurenzo, M. J., *Hormel Foods Corporation,* 12/18/00-12/31/99, $115,541, **"Anaerobic Treatment of Packing Plant Wastewater."**

The objectives of this research were to evaluate and compare the ability of the anaerobic sequencing batch reactor (ASBR) and the static granular bed reactor (SGBR) to provide satisfactory and cost-effective treatment of packinghouse wastewater from the Hormel Foods Corporation in Austin, Minnesota. Laboratory-scale (5 L) ASBR and SGBR systems were fed with the Hormel Foods wastewater and operated under different hydraulic retention times and organic loading rates in the Biotechnology Research Laboratories at Iowa State University. The results of the lab-scale study were used for comparison and evaluation of various configurations treating packinghouse wastewater. Full-scale design parameters, e.g., hydraulic retention time (HRT) and organic loading rate, were also developed for each system according to the experimental data. The practical and engineering significance of this research was to demonstrate the possibilities of using a high rate anaerobic treatment process on the Hormel Foods wastewater. Since it was obtained prior to DAF treatment, the tested wastewater was at a higher COD and SS concentration than currently received at the anaerobic contact system in Austin. Therefore, the advantage of the ASBR or SGBR system would be to allow a higher organic loading rate to be treated in the existing digester volume. It is likely that the sedimentation (clarifier) tanks following the digesters would not be necessary with either the ASBR or SGBR system. Although sedimentation tanks were used in the laboratory study, their performance was not effectively evaluated due to the difficulties in size and scale effects at the laboratory volumes considered. With respect to the differences between the ASBR and SGBR systems, it was clear that the SGBR offered significant advantages over the ASBR system. The SGBR had better effluent quality as evidenced by lower VFA, BOD5, COD, and TSS concentrations. The discrepancies in effluent quality became more dramatic as the HRT was decreased below 24 h. While stable SGBR operation was observed at HRTs as low as 8 h, the ASBR performance became erratic at the 18-h HRT. Lower HRTs were particularly problematic for the ASBR, and total failure occurred at the 8-h HRT. Therefore, an HRT of at least 24 h would be recommended for design purposes for the ASBR. The HRT design recommendation for the SGBR based on the laboratory study is not as obvious, since satisfactory performance was seen at all HRTs studied. Based on the performance results, a target design HRT of 14 to 18 h might be recommended. VFA concentrations began to increase slightly at the 12-h HRT, possibly indicating a change in the stress of the microbial population. The advantage of retrofitting the existing digesters to SGBRs at the Industrial Section Treatment Plant in Austin, Minnesota, would be the ability to achieve higher hydraulic and organic loadings, the production of higher quality effluent, the elimination of the sedimentation tanks, and the elimination of recycle pumping. The potential risk of such a retrofit is that the technology has not been tried on a larger scale. Ongoing pilot plant testing at the Hormel Foods plant should help to remove this uncertainty. (Administered by Institute for Physical Research and Technology)

Ellis, T. G., *Boone County Landfill*, 6/15/02-12/31/03, $25,595, **"Evaluation of Leachate Treatment Options Using the Static Granular Bed Reactor."**

This project will evaluate the effect on simulated landfill performance of leachate treatment and recycle options using the static granular bed reactor (SGBR). The SGBR was developed at Iowa State University to provide cost-effective treatment of medium- and high-strength

industrial and municipal wastewater. The application of the SGBR to landfill leachate appears to be an excellent application due to the concentrated nature and low solids concentrations in leachate. The treatment of the Boone County Landfill leachate and subsequent recycle of the treated leachate through a simulated landfill column will not only provide an integrated strategy for leachate management but is also expected to provide enhanced landfill stabilization. Leachate recycle is expected to increase the useful life of the landfill, since the added biological activity within the landfill will cause a volume reduction of the organic constituents. In this sense, the leachate recycle will create a landfill bioreactor. Three landfill leachate management strategies will be evaluated in a side-by-side comparison of simulated landfill columns. In the first simulated landfill, no leachate recycle will be employed. In the second column, untreated leachate will be recycled to the top of the column. In the third column, the leachate will be treated in the SGBR reactor and returned to the top of the landfill column (i.e., the second and third landfill columns will become landfill bioreactors). The results of this research will provide the basis for a recommended landfill leachate management strategy to be recommended for the Boone County Landfill. The resulting management strategy is expected to reduce operating costs at the landfill by eliminating the storage and hauling of leachate to the Boone Water Pollution Control Plant. It is also expected to generate increased landfill capacity due to the enhanced decomposition and volume reduction of the organic constituents.

Ellis, T. J., *Center for Advanced Technology Development*, 11/1/02-5/30/03, **"On-site Pilot Demonstration of the Static Granular Bed Reactor."**

After the successful demonstration of the static granular bed reactor treating packinghouse wastewater from the Hormel Foods Corporation in a laboratory study at Iowa State University, the on-site pilot-scale project will evaluate the ability of the SGBR on a near full-scale facility to be constructed at the Austin site. The pilot-scale SGBR system will be fed with the Hormel Foods plant wastewater and operated under different hydraulic retention times and organic loading rates. The results of the pilot study will be used for comparison evaluation of various high rate anaerobic digestion configurations treating packinghouse wastewater. Full-scale design parameters, e.g., hydraulic retention time (HRT) and organic loading rate (OLR), will be recommended for the SGBR according to the experimental data. The successful operation of the SGBR on a pilot-scale will be a critical element in the performance evaluation and demonstration of this new technological advance. The commercialization potential for the SGBR is extremely good due to its simple design and operational advantages over conventional (e.g., upflow anaerobic sludge blanket reactor) systems.

Fan, M., & **van Leeuwen, J. H.,** *ISU Research Park*, 2/24/04-12/31/04, $13,079, **"Improved Nitrate Removal from Drinking Water by Ion Exchange**."

(Administered by Institute for Physical Research and Technology)

Fanous, F. S., Phares, B. M., & Wipf, T. J., *Iowa Department of Transportation*, 1/1/02-12/31/03, $99,766, **"Evaluation of Corrosion-Resistant Steel Reinforcing in the Deck Slab of a Three-Span Prestressed Girder Bridge."**

One of the biggest problems with bridge decks is deterioration due to corrosion of conventional steel reinforcing bars. The deck deterioration of traditional reinforced concrete decks due to harsh environments and traffic loads could be minimized using the recently developed corrosion resistant steel reinforcement in reinforced decks. This should reduce long term maintenance and life-cycle costs. This project will monitor a three span prestressed girder bridge in Iowa. Dual bridges carrying eastbound and westbound traffic will be constructed. The eastbound bridge will use the corrosion resistant reinforcing steel and westbound bridge will use conventional reinforcing steel. This project will provide the opportunity to assess the difference in performance between the conventional and innovative materials.

Fanous, F. S., Phares, B. M., & Wipf, T. J., *City of Bettendorf*, 3/1/03-2/28/06, $72,712, **"Evaluation of a Three-span, Prestressed Concrete Girder Bridge Constructed with FRP Components."**

The accelerated deterioration of steel and concrete bridges has caused significant problems in the management and maintenance of the highway infrastructure. To date there have been relatively few in-service vehicular bridges constructed and monitored. While the potential exists for durable bridges to be built from FRP, their performance can only be evaluated through a series of monitoring programs. This proposal to the City of Bettendorf is to allow the transfer of the monitoring/evaluation portion of the IBRC Program funding to Iowa State University to perform these tasks.

French, C., Lopez, R., & Sritharan, S., *National Science Foundation*, 12/1/03-11/30/05, $223,682, **"Collaborative Research: Testing and Analysis of Nonrectangular Walls Under Multi-Directional Loads."**

This project represents a collaborative analytical, experimental and educational effort to investigate the behavior of nonrectangular structural walls subjected to the effects of multidirectional loading. Nonrectangular structural walls are often used to resist lateral loads and limit deformations in structural systems located in regions of moderate and high seismicity. Although such wall systems are intended to resist the lateral forces along the orthogonal axes of the building, past research has been limited to unidirectional studies of these systems due to limitations in experimental capabilities, as such the numerical models developed to describe their behavior have been calibrated to this limited data. The proposed project employs one of the first applications of an NSF George E. Brown, Jr., Network for Earthquake Engineering Simulation (NEES) large-scale testing facility, the Multi-Axial Subassemblage Testing (MAST) System at the University of Minnesota, (www.mast.umn.edu) to achieve the multidirectional testing requirements. This facility is ideal for the investigation as it is capable of six-degree-of-freedom (6-DOF) control including the ability to specify moment to shear profiles about each orthogonal axis to simulate the distribution of lateral forces applied to the wall system. It is anticipated that multidirectional loads will have a significant impact on the behavior of these nonrectangular wall systems as they are intended to resist lateral forces and limit deformations along the orthogonal axes of the building. The

collaborative team of researchers from the University of Minnesota, Iowa State University, University of Puerto Rico at Mayaguez and The Nakaki Bashaw Group, Inc., a consulting firm in Irvine, California, bring combined strengths and resources in experimentation, analysis, design practice and education, all of which are essential components of the proposed investigation. All collaborative researchers will remotely participate in the experimentation including the operation of the test which will reside with Iowa State University.

Intellectual Merit: This project builds on the combined strengths of the collaborative research team and newly available experimental capabilities to investigate a critical structural element for seismic regions, nonrectangular structural walls. The analytical and experimental studies developed in this project are expected to lead to improved understanding of the behavior, analysis techniques, and design of nonrectangular wall systems. The project will also recommend appropriate modifications to the design and detailing of nonrectangular wall elements suggested in the current building codes.

Broader Impact: The project has a significant educational component through plans to incorporate the testing and simulation into the curriculum at the three collaborative universities including the participation of underrepresented groups. The involvement of the practicing engineer from the beginning of the project, who along with the Principal Investigator is involved in the development of the American Concrete Institute Building Code, ensures that the appropriate research findings may be translated directly into practice with improved detailing recommendations for nonrectangular structural walls. As such, this project will improve the nation's infrastructure in seismic regions. It is also anticipated that the results of this project will lead to valuable information for future remote users of the MAST system. This information will include documentation of any observed deformations of the reaction wall and crosshead, as well as the ability of the system to function under mixed mode control with large applied forces. The performance and userability evaluations of the remote participant capabilities within the MAST are intended to lead to an improved system for remote participation. The Co-PIs have a vested interest within this project to actively evaluate these capabilities as they are essential to their participation in this project. It is intended that the research data be made available to the research community through the NSF, George E. Brown Jr., NEES National Data Repository. Any hardware or instrumentation purchased at the University of Minnesota through this project will be available to future users of the MAST facility.

Gallus, W. A., Haan, F. L., & Sarkar, P. P., *National Science Foundation,* 10/1/02-9/30/05, $300,000, "**Study of Tornado-induced Wind Loads on Built Structures**."

This project uses a synergistic approach that involves use of field data, numerical simulation, and laboratory simulation to study tornado-induced wind loads on man-made or built structures. The primary objective of this project is to quantify tornado-induced wind loads on typical structures such as low-rise and high-rise buildings, dome-shaped and curved-roof structures, and slender chimneys and towers that comprise the majority of our built environment. In this project, a laboratory tornado simulator at Iowa State University (ISU) is used to realistically produce a variety of tornado-like vortices for testing their loading effects on geometrically scaled models of built structures. Field measurement data from the University of

Oklahoma's "Doppler on Wheels" studies along with the data generated by numerical simulations of tornado vortex winds at ISU to extrapolate the field data (available for 50 ft and above) to ground level are used to validate the flow field generated by the laboratory tornado simulator. This laboratory simulator uses an innovative mechanism that allows it to produce a translating tornado-like vortex with different swirl ratios, core diameters and Reynolds numbers suitable for geometrically scaled model testing.

Keywords: tornado-induced wind loads, laboratory tornado simulation, loads on built structures, numerical tornado simulation, geometrically scaled model testing

Gaunt, J. A., & **Ong, S.-K.,** *Awwa Research Foundation,* 2/15/04-7/15/07, $505,699, **"Impact of Petroleum-based Hydrocarbons on PE/PVC Pipes and Pipe Gaskets**."

Water utilities will be surveyed by mail to gather information about their distribution systems and their experience with incidents involving permeation of plastic pipes and gasket materials by petroleum-based hydrocarbons. Telephone interviews for the purpose of developing detailed case histories will be conducted with utilities that report permeation incidents, successful use in contaminated areas, or portions of their systems to be at risk. Laboratory experiments will be conducted to assess the performance of pipes and gaskets and their susceptibility to permeation by organics under realistic environmental conditions. The permeation results will then be correlated to the data obtained by the accelerated pipe and gasket materials tests. These tests will be gravimetric based on the equilibrium sorption of a contaminant by a pipe material, determination of the rate of permeation of contaminants through pipe material by microscopic visualization, and measurement of polymer chain mobility using near infrared reflectance spectroscopy. The accelerated tests will provide a rapid means of comparing the relative susceptibility to permeation of pipes of differing polymers, additive systems, and extrusion processes, and to predict their performance in the field. This project will advance the water industry's understanding of the parameters that influence permeation of plastic pipes under conditions of soil contamination that are typically encountered in the field.

Keywords: petroleum hydrocarbons, plastic pipes, gaskets, permeation, drinking water

Gieseman, D. J., & **Souleyrette, R.,** *Iowa Department of Transportation,* 4/1/03-12/31/03, $29,177, **"Crash Mapping and Analysis Tools: Traffic and Criminal Software Interface Framework."**

Gieseman, D. J., & Souleyrette, R., *Iowa Department of Transportation,* 10/1/99-6/30/04, $236,968, **"Development of an Advanced Traveler Information Weatherview."**

Gieseman, D. J., & Souleyrette, R., *Iowa Department of Transportation,* 1/1/99-6/30/03, $305,848, **"Incident Location Tool Support for the Iowa Department of Transportation."**

Gilbert, J. M., & **Strong, K. C.,** *Data Builder,* 12/8/03-2/28/06, $18,314, "**Measuring and Predicting Improvement in Project Management and Job Closeout Productivity from Implementing an Electronic Program**."

(Administered by Institute for Physical Research and Technology)

Greimann, L. F., Phares, B. M., & Wipf, T. J., *Iowa Department of Transportation,* 11/1/02-10/31/05, $154,980, **"Evaluation of a Bridge Constructed Using High-performance Steel."**

In recent years, high-performance steel (HPS) has been used in bridge applications in order to deal with infrastructure problems. The proposed project will include design, fabrication, and construction documentation and post-construction monitoring and evaluation of a two-span continuous girder bridge using HPS. The bridge will be instrumented and both static and dynamic load tests will be performed to establish a baseline condition of behavior (strain, deflection, and acceleration). A comparison of the load test performance will be made with the expected design behavior. Another similar load test will be made after the first and second year of service.

Greimann, L. F., & Wipf, T. J., *Iowa Department of Transportation; Iowa Highway Research Board,* 5/1/03-4/30/06, $196,421, **"Performance Evaluation of Steel Bridges: Phase II."**

There exists a need for the long-term monitoring of two types of highway bridges in Iowa. These bridges either have details with known problems or details that have not been validated by actual field data. Long-term monitoring of these steel bridges will allow the bridge owner to investigate these details further. In addition, some of the recently developed data reduction tools can be evaluated with respect to continuous monitoring of Iowa's bridges.

Greimann, L. F., *ISU Foundation,* 5/31/02-9/9/10, $78,022, **"Town Engineering—Remodel Teaching Labs."**

Gu, R., *Houston Engineering, Inc.,* 08/15/97 on, $10,900, **"Channel Losses and Flow Requirements for Water Quality Protection in the Sheyenne River and the Red River of the North, North Dakota."**

The objectives of this project are to (1) evaluate channel losses along the Sheyenne River, North Dakota, and (2) perform technical analyses to determine the stream-flow requirements for maintaining water quality in the rivers. Channel losses due to seepage or infiltration, bank storage, and evaporation affect the delivery of water to the Red River of the North if they are an important component of the hydrologic budget. Three methods are used to evaluate channel losses along the Sheyenne River: (1) long-term hydrological budget, (2) hydrograph method, using discharge or flow volume for short-period water balance, and (3) statistical method, using auto-correlation and power function. To determine the in-stream flow needed for attaining the water quality criteria for the Sheyenne River and the Red River of the North, two methods are used: (1) evaluation of existing water quality conditions and violations through statistical analyses of historical data, and (2) mass balance.

Gu, R. R., & Klaiber, F. W., *Federal Highway Administration,* 10/12/01-9/12/03, $146,485, **"Development of a Systematic Design Approach for Low Water Stream Crossings."**

This study will (1) summarize recent developments regarding the design of low water stream crossings (LWSC) and update the information contained in the previous reports, and (2) develop a process for formalizing the selection, design, and construction of LWSC and provide appropriate guidance to both federal and state agencies.
Keywords: stream crossing, low volume roads, transportation

Haan, F. L., & Sarkar, P. P., *Pioneer Hi-Bred International, Inc.,* 12/3/02-12/31/99, $67,065. **"Development of Field-testing Equipment and Procedure for Evaluating Susceptibility of Corn Plants to Brittle-Snap Breakage in High Winds**."

Haan, F. L., & **Sarkar, P. P.,** *National Science Foundation,* 8/1/02-7/31/05, $160,000, "**Next Generation Wind Tunnel for Aerodynamic and Atmospheric Boundary Layer Simulation and Testing**."

The purpose of this project is to design and build a wind tunnel for aerodynamic and atmospheric boundary layer simulation and testing at Iowa State University. It addresses the need for investment in wind hazard research and education infrastructure by building a facility that represents a new generation of boundary layer wind tunnels designed for more realistic simulation of extreme winds. Extreme wind loads result from extreme weather events (gust fronts, thunderstorms, hurricanes) where non-stationary gusts, transitional flow structures, and rapid wind directionality changes might play a significant role. The current state-of-the-art boundary layer wind tunnels cannot simulate such events. The usual assumption in current practice is that atmospheric wind is adequately simulated with stationary mean and turbulence flow properties. Adequate modeling of small-scale turbulence is important and requires a capability to generate high velocities in a relatively large test section. The wind tunnel design in this project incorporates two test sections (2.44 m x 1.83 m and 2.44 m x 2.21 m) with capabilities to generate gusts, active turbulence, and a high velocity of 50 m/s. It will be part of the Wind Simulation and Testing Laboratory that also includes a tornado simulator, a microburst simulator, and an open circuit wind tunnel.

Keywords: atmospheric boundary layer, next generation wind tunnel, gust generation, active turbulence, extreme wind simulation, aerodynamic testing

Hallmark, S. L., & Souleyrette, R., *Iowa Department of Transportation,* 7/1/01-7/31/03, $70,000, **"Application of Advanced Remote Sensing Technology to Transportation Asset Management."**

Hallmark, S. L., & Souleyrette, R, *Iowa Department of Transportation,* 7/1/02-5/14/03, $17,500, **"Change Detection Analysis."**

Hallmark, S. L., *Iowa Department of Transportation,* 7/1/03-9/30/04, $45,000**"Development of New Strategies for Location Safety Improvement Candidate Locations."**

The purpose of this project is to evaluate different methods to rank high-crash intersections as part of the Iowa DOT's Safety Improvement Candidate List top 200. (Administered by Center for Transportation Research and Education)

Hallmark, S. L., *Iowa Department of Transportation,* 8/1/02-12/31/03. $43,000, **"Development of a System for Collection and Analysis of Intersection Safety Data."**

Hallmark, S. L., *Federal Highway Administration,* 5/1/03-1/31/04, **"Evaluating Speed Differences between Passenger Vehicles and Heavy Trucks for Transportation-related Emissions Modeling**."

Heavy vehicles emit emissions at different rates than passenger vehicles. They may behave differently on the road as well, yet they are often treated similarly to passenger vehicles in emissions modeling. Although not frequently considered in calculating emission rates, differences in the operating speeds of passenger vehicles and heavy trucks may influence emissions. The

main goal of this research project was to evaluate whether heavy trucks typically travel at significantly different operating speeds than passenger vehicles and what impact differences in on-road speeds would have on emissions. Average speeds and spot speeds were collected for heavy trucks and passenger vehicles for four arterial segments and spot speeds were collected for two freeway segments in Des Moines, Iowa. Average and spot speeds were collected for four arterial segments and three freeway segments in the Minneapolis/St. Paul, Minnesota, metropolitan area. The results of this research show that heavy trucks and passenger vehicles operate differently on the road. Average and spot speeds were compared for heavy trucks and passenger vehicles by facility. Average and spot speeds for heavy-duty trucks were lower than for passenger vehicles for all locations. Differences could have consequences for project level and regional emissions modeling, particularly since the ability to demonstrate conformity is based on the ability to correctly estimate and model vehicle activity.

Hallmark, S. L., & **Souleyrette, R.,** *University of California-Santa Barbara,* 5/15/02-5/14/04, $107,596, "**Remote Sensing Applications to Infrastructure Management (NCRST-I)—Year 3."**

Hallmark, S. L., *Minnesota Department of Transportation,* 7/1/03-9/30/06, $51,180, "**Street Lighting at Isolated Rural Intersections**."

(Administered by Center for Transportation Research and Education)

Harries, K., & Porter, M. L., *National Science Foundation,* 1/1/04-12/31/05, $11,876, "**Workshop on Research in FRP Composites in Concrete Construction; March 13, 2004; Washington, D. C.**."

As an emerging technology, the use of fiber reinforced polymer (FRP) materials in the civil infrastructure has seen a rapid growth. Despite the abundance of research activity and the growing number of demonstration and commercial applications, many issues involved in the use of FRP materials in infrastructure remain to be addressed. In some cases, the dearth of understanding and/or design guidance represents a significant limitation to the broader implementation of FRP materials in infrastructure applications. The objective of this workshop is to bring together industry, practitioner, and academic experts to help identify and prioritize research areas and issues requiring further attention in order to improve our understanding of the behavior of FRP materials and FRP structural and repair systems. The primary deliverable of this workshop will be the identification of critical research needs affecting the implementation of FRP composites in concrete construction applications and the development of a consensus on the priority of these needs. Having developed such a consensus, a unified research approach addressing the research needs and matching research needs with appropriate funding agencies/opportunities can be established. The broader impact resulting from this effort is not only the identification of critical needs but also the development of a consensus-based unified approach to future research needs. This broader impact is anticipated to aid the funding agencies in identifying priorities of research in the area of FRP.

Hawkins, N. R., *Iowa Department of Transportation,* 10/1/03-6/30/04, $24,931, "**Planning, Developing, and Implementation of the Iowa Pavement Markings Management Program**."

This research project is aimed at development of an Iowa Pavement Markings Management System (PMMS). The project

goal is to create a practical and useful management program specific to pavement markings for the Iowa Department of Transportation. This system will also be valuable to Iowa cities and counties for managing pavement marking resources. (Administered by Center for Transportation Research and Education)

Jahren, C. T., & White, D. J., *Minnesota Department of Transportation*, 1/2/03-9/30/04, $60.000, **"Cost Comparison of Treatments Used to Maintain or Upgrade Aggregate Roads."**

Jahren, C. T., & White, D. J., *Iowa Department of Transportation*; *Iowa Highway Research Board*, 8/15/02-5/31/04, $100,000, **"Determination of the Optimum Base Characteristics for Pavements (TR-482)."**

The function of pavement drainage in achieving service life of pavements has become apparent in recent years, both in design and maintenance. The benefits of retrofitting existing pavements with edge drains has been demonstrated to be cost effective means of improving pavement drainage, thereby aiding in achieving design service life. The objectives of this study are to: 1. Determine the optimal range for in-place stability and in-place permeability based on Iowa aggregate sources 2. Evaluate the feasibility of an air permeameter for determining the permeability of open and well-graded drainage layers in situ 3. Develop reliable end-result QC/QA specifications for stability and permeability 4. Refine aggregate placement and construction methods to optimize uniformity.

Jahren, C. T., & Jaselskis, E. J., *Iowa Department of Transportation*, 1/1/03-12/31/05, $270,319, **"Developing an Effective Construction Training Program for Hispanic Supervisors and Craft Workers."**

Hispanics make up a growing percentage of the craft workers entering the construction industry, and this has created several challenges for American construction companies. This study addresses the situation by investigating training needs for Hispanic construction craft workers and developing a training program for them within the industry. In order to evaluate current craft workers' conditions within the construction industry, Iowa State University researchers conducted a survey, with 98 Hispanic craft workers as respondents from 10 construction companies, to determine current working conditions. The results confirm that the language barrier is an obstacle for both the Hispanic workers and the English-speaking employees involved in construction projects. As a part of this research, two training courses were designed to help both American construction companies and their Hispanic labor force to overcome the barriers that keep them from succeeding safely and productively. A training course titled English as a Second Language Survival Course was developed to facilitate basic communication between Hispanic workers and their American supervisors using construction-focused terminology. This course was delivered once as a trial run for a two-hour duration and twice for a full-length duration of eight hours. Important feedback was obtained from participants as part of the evaluation of the course. "How much of the course content will be useful in your working environment?" was asked; 40% of workers said "all of it" and 60% said "most of it." Another question was "Was it worth taking the time to attend the course?"

to which 94% answered "definitely" and 6% answered "yes." A second training course titled Stepping Up to Supervisor Course for Hispanic Construction Workers was also developed to provide an effective tool to help companies promote those Hispanic craft workers whose willingness and skills meet the requirements to advance to a supervisory position in an American construction company. This course was offered in the spring of 2004.

Jahren, C. T., & White, D. J., *Iowa Department of Transportation/Iowa Highway Research Board,* 5/15/03-11/15/05, $169,067, **"Embankment Quality Phase IV—Application to Unsuitable Soil**."

The results of Phases I, II, and III indicate that the proposed soil classification system, QM-E program, Grading Technician Level I certification, and lab training equipment are adequate but need some modifications, specifically for "unsuitable soils."

Jahren, C. T., *Iowa Department of Transportation/Iowa Highway Research Board,* 11/1/03-4/30/05, $97,941, "**Evaluation of Long-term Field Performance of Cold In-place Recycled Roads**."

The ultimate objective is to develop an understanding of: how the engineering properties of CIR material, the environment, traffic and subgrade conditions influence the performance of the CIR pavement; how the engineering properties of CIR material changes over time; and how the mix design and construction methods influence the engineering properties of CIR materials. The final objective is to obtain a rational mix design method and construction quality control system that is generally accepted in Iowa. (Administered by Center for Transportation Research and Education)

Jahren, C. T., *Iowa Department of Transportation-Highway Division*, 11/01/00-10/31/03, $426,212, **"I-235 Scheduling Support."**

Continuing for the fourth year, Iowa State University (ISU) will assist the Iowa Department of Transportation (DOT) in planning for the reconstruction of I-235 project—providing scheduling assistance, performing construction monitoring, performing cost estimation, and continued advising of Team I-235 on construction staging issues. Also, ISU will help the Iowa DOT implement selected activities with its own employees. ISU will begin the development of an appropriate database and other aids that will facilitate the scheduling of future urban corridor rebuilding efforts. Keywords: heavy/highway construction, Des Moines, Iowa, I-235, corridor schedule, scheduling, Iowa Department of Transportation, DOT, Iowa State University, Department of Civil and Construction Engineering

Jahren, C. T., *Iowa Highway Research Board,* 11/1/03-12/31/05, "**Thin Maintenance Surfaces—Phase III: Municipal Streets and Low-volume Rural Roads**."

The objective of this project is to fully develop a thin maintenance surface technology transfer program specifically for municipal and secondary road personnel--specifically the following groups: municipal and county engineers, consulting engineers and contractors involved in secondary road and street maintenance, secondary road and street superintendents, and officials involved in street maintenance for small municipalities.

Jaselskis, E. J., EFCO, 6/15/03-8/15/03, **"An Investigation of Business Opportunities in Mexico."**

The principal objective of this research effort is to help EFCO officials make better decisions related to establishing alliances with cement and concrete producers in Mexico. The overall intent is to establish procedures to create opportunities to increase market share among large construction firms which utilize systems for concrete construction for which EFCO provides technology.

Jaselskis, E. J., *National Cooperative Highway Research Program,* 5/1/03-10/30/05, "**Nondestructive Testing Technology for Quality Control and Acceptance of Flexible Pavement Construction**."

Kamyab, A., & Smadi, O. G., *Iowa Department of Transportation/Iowa Highway Research Board,* 4/1/02-9/30/04, $59,272, **"Development of a Method to Determine Pavement Damage due to Detours and Haul Roads."**

Secondary roads and municipal streets are often used as temporary detours and haul roads by the Iowa DOT during construction or maintenance projects on primary highways. Advances in pavement condition data collection technologies make it feasible to gather more objective and consistent pavement damage information. The purpose of this project is to develop an objective method for determining pavement damage on secondary highways and municipal streets resulting from additional traffic loading on detours and haul roads used temporarily by the Iowa DOT. (Administered by Center for Transportation Research and Education)

Kannel, E. J., *Iowa Department of Public Safety,* 6/1/03-12/31/04, "**In-Pavement Pedestrian Flasher Evaluation, Cedar Rapids, Iowa."**

Numerous strategies have been experimented with nationwide in an attempt to reduce the overall number of pedestrian-vehicle crashes, especially in instances where improper crossing or failure to yield was the proximate cause of the crash. Some of these measures include overhead signs, flashing warning beacons, advanced crossing signs, more visible pavement markings, in-street "Yield to Pedestrian" signs, and, more recently, in-pavement flashing lights. Pedestrian safety has been a key issue for the city of Cedar Rapids, Iowa, in particular at noncontrolled intersections and mid-block crossings. In 2002, the city council gave preliminary approval to implement a pedestrian-actuated overhead flasher system in conjunction with an in-pavement flasher system at the intersection of 1st Avenue NE and 4th Street NE in the downtown central business district. This location is uncontrolled and has several elements that can create conflicts between pedestrians, vehicles, and trains that service local industry. This report summarizes the results from a small-scale study completed by CTRE to evaluate the effectiveness of the in-pavement flasher system installed in downtown Cedar Rapids. The installation of in-pavement flashing warning lights at the pedestrian crosswalk at this site has had a net positive effect on the safety characteristics of the location. The results of this study show a marked improvement in motorist compliance with the state law requiring that motorists yield to pedestrians in the crosswalk. The pedestrian and motorist surveys show that both groups felt the in-pavement flashing lights have increased motorist awareness, especially at night. The data indicate the in-pavement flashing warning lights improved the

motorists' responses to pedestrians in the area, and that the system could be operational throughout summer and winter conditions.

Kannel, E. J., & Souleyrette, R., *Iowa Department of Transportation,* 6/1/02-4/30/03, $15,857 "**Pedestrian Safety."**

Klaiber, F. W., Phares, B. M., White, D. J., & Wipf, T. J., *Iowa Department of Transportation,* 12/1/02-6/30/04, $99,265, **"Development of Abutment Design Standards for Local Bridge Designs."**

The objective of the project is to prepare a series of abutment designs that complement previously developed replacement superstructures. As a minimum, the following abutments will be investigated: simple concrete abutments, sheet pile backwalls, and timber backwall designs.
Keywords: low-volume road bridge abutments, design guidelines

Klaiber, F. W., *U.S. Department of Transportation,* 9/1/02-12/31/99, $1,500, **"Dwight D. Eisenhower Transportation Fellowship (DDETFP)."**

Klaiber, F. W., & Wipf, T. J., *Iowa Department of Transportation,* 02/01/99-12/31/08, $294,760**, "Effective Structural Concrete Repair."**

The primary object of the project is to determine existing procedures and develop new procedures for repairing reinforced and prestressed concrete in bridges. Procedures will initially be tested in the laboratory and then employed on existing bridges. The various repairs will be monitored for several years to determine their effectiveness.
Key Words: repair, strengthening, rehabilitation

Klaiber, F. W., Phares, B. M., & Wipf, T. J., *Tama County,* 1/1/03-12/31/06, $69,973, **"Evaluation of a Single-span Steel-girder Bridge Using a Steel-free Deck System."**

The accelerated deterioration of concrete bridge decks has caused significant problems in the management and maintenance of the highway infrastructure. Recently various systems have been proposed that use no reinforcing steel in the bridge deck. The objective of this work is to monitor and evaluate the performance of one such bridge.

Klaiber, F. W., Phares, B. M., & Wipf, T. J., *Iowa Department of Transportation,* 9/1/02-8/31/05, $64,800, **"Evaluation of a Steel Girder Bridge Strengthened Using Fiber Reinforced Polymer Plates."**

The recent development of high performance materials like fiber reinforced polymers provide the potential to rehabilitate steel girder bridges in a cost effective manner. This project will strengthen one bridge and document and evaluate the effectiveness of the treatment.

Klaiber, F. W., & Wipf, T. J., *Iowa Department of Transportation,* 12/1/01-11/30/03, $190,890, **"Investigation of the Modified Beam-in-Slab Bridge System."**

Klaiber, F. W., *Elsevier Science Ltd./Butterworth Heinemann,* continuous, $1,500, **"Regional Editor of Engineering Journal."**

Dr. Klaiber is currently serving as North American regional editor of the UK journal entitled *Construction and Building Material*. Dr. M. C. Forde, University of Edinburgh, serves as editor-in-chief. The other two regional editors are from Italy and Japan. Funds provided are for expenses associated with serving as regional editor.

Laurenzo, M. J., & van Leeuwen, J. H., *U.S. Filter Corporation*, 6/28/02-8/31/08, $11,499, **"Improvement to Backwashing Procedures of Sand Filters."** (Administered by Institute for Physical Research and Technology)

Laurenzo, M. J., & van Leeuwen, J. H., *Warren Frozen Foods, Inc.*, 3/28/02-8/31/03, $19,578, **"Improving Activated Sludge Treatment of Pasta Wastewater."** (Administered by Institute for Physical Research and Technology)

Lohnes, R., & **Schaefer, V. R.,** *Iowa Department of Transportation,* 10/1/03-3/31/05, $107,070, **"Determination and Evaluation of Alternate Methods for Managing and Controlling Highway-related Dust, Phase II—Demonstration Project**."

Lutz, D. S., *U.S. Army Corps of Engineers,* 1/9/03-1/15/05, $240,864, "**Water Quality Study, Red Rock Reservoir."**

The Des Moines River Water Quality Network is a surface water quality project sponsored by the U.S. Army Corps of Engineers that collects water samples year-round at locations along the Des Moines and Raccoon rivers and Saylorville and Red Rock reservoirs. The purpose of the projects is to evaluate the effects of Saylorville and Red Rock dams on downstream river quality and to characterize upstream water quality. The project was initiated in 1967 as a pre-impoundment study of the Saylorville Reservoir reach and has evolved into a post-impoundment study of Saylorville and Red Rock reservoirs. The scope of work under the current research contracts specifies that over 40 parameters be quantified at 7 different sites on 22 separate occasions per year. The parameters examined include dissolved oxygen, pH, alkalinity, hardness, ammonia, nitrite plus nitrate, phosphate, BOD, suspended solids, chlorophyll pigments, coliform bacteria, and trace metals. Bacteria monitoring at swimming beaches occurs weekly for the period mid-May through mid-September. Additionally, pesticide residues in fish will be examined. In addition, at Red Rock Dam water from seven groundwater monitoring wells will be characterized monthly to quantify mineral saturation indices. Additional support from the Iowa Department of Natural Resources has allowed the reinstatement of important nutrient parameters and the evaluation of mercury concentrations in fish.

Lutz, D. S., *U.S. Army Corps of Engineers,* 1/9/03-1/15/05, $242,810, "**Water Quality Study, Saylorville Reservoir."**

The Des Moines River Water Quality Network is a surface water quality project sponsored by the U.S. Army Corps of Engineers that collects water samples year-round at locations along the Des Moines and Raccoon rivers and Saylorville and Red Rock reservoirs. The purpose of the projects is to evaluate the effects of Saylorville and Red Rock dams on downstream river quality and to characterize upstream water quality. The project was initiated in 1967 as a pre-impoundment study of the Saylorville Reservoir reach and has evolved into a post-impoundment study of Saylorville and Red Rock reservoirs. The scope of work under the current research contracts specifies that over 40 parameters be quantified at 7 different sites on 22 separate occasions per year. The parameters examined include dissolved oxygen, pH, alkalinity, hardness, ammonia, nitrite plus nitrate, phosphate, BOD, suspended solids, chlorophyll pigments, coliform bacteria, and trace metals. Bacteria monitoring at swimming beaches occurs weekly for the period mid-May through mid-September. Additionally, pesticide residues in fish will be examined. In addition, at Red Rock Dam water from

seven groundwater monitoring wells will be characterized monthly to quantify mineral saturation indices. Additional support from the Iowa Department of Natural Resources has allowed the reinstatement of important nutrient parameters and the evaluation of mercury concentrations in fish.

Maze, T. H., *Iowa Highway Research Board,* 5/1/03-4/30/05, **"Development of Winter Performance Measures for Highway Winter Maintenance Operations**."

Maze, T. H., *Iowa Department of Transportation,* 10/1/03-12/31/04, $39,720, "**Synthesis of Practice—Safety and Operations of High-speed Expressway Intersections**."

This project involves characteristics of safety issues for the elderly and other drivers at high-speed at-grade intersections. (Administered by Center for Transportation Research and Education)

Maze, T. H., *National Science Foundation,* 9/1/03-8/31/04, "**The Integration of ITS-generated Data Sets to Study the Weather Impacts on Urban Freeway Traffic Operations and Capacity**."

Ong, S.-K., *U.S. Environmental Protection Agency*, 07/16/01-07/15/03, $25,070, **"Application of Biological Aerated Filters to Meet NPDES Ammonia Limits for Small Communities."**

In the state of Iowa, there are over 100 aerated lagoons that do not meet NPDES discharge limits for ammonia over the winter months. Similar problems are experienced by other states such as Minnesota, Nebraska, and Wisconsin with their aerated lagoon facilities. Various state agencies are studying alternative treatment technologies and, eventually, may require these facilities to comply with their discharge limits. The objectives of this project are to investigate the application of biological aerated filters (BAFs) for nitrification at low temperatures and to provide a preliminary assessment of its feasibility for small communities to meet their NPDES limits. In addition, the objective of this study is to develop a single-stage reactor containing both an anoxic and oxic zone for nutrient removal. BAFs is a compact system and can be used as an add-on to existing facilities or used as a secondary treatment at small communities' wastewater treatment facilities. BAFs is a popular treatment system in Europe but rarely used in the U.S.

Ong, S.-K., & Stenback, G. A., *Alliant Energy,* 1/1/01-12/31/99, $97,446, **MENA Research and Demonstration Site, Cherokee, Iowa."**

Ong, S.-K., & Stenback, G. A., *Alliant Energy,* 7/1/03-12/31/03, $26,117, **"Review of Selected FMGP Sites for Potential Monitored Natural Attenuation Applicability."**

The purpose of this research is to examine selected former manufactured gas plant site reports to look for potential sites to implement a monitored natural attenuation program.
Keywords: coal tar, natural attenuation

Phares, B. M., *Wisconsin Department of Transportation,* 10/1/03-9/30/05, **"Enhancement of Wisconsin DOT NDE Capabilities**."

Phares, B. M., *Wisconsin Department of Transportation,* 10/1/03-11/23/04, $30,613, **"Health Monitoring of Bridge Structures and Components Using Smart-structure Technology**."

(Administered by Center for Transportation Research and Education)

Porter, M. L., *Federal Highway Administration/Hughes Brothers/Iowa Highway Research Board,* 10/1/03-10/31/05, $100,002, **"Laboratory Study of Structural Behavior of Alternative Dowel Bars**."

The objective of this research is to determine an improved test procedure to replace the AASHTO T253 procedure and the corresponding analysis to incorporate the modulus of dowel support based upon laboratory tests.

Porter, M. L., *Masonry Institute of America,* 6/5/04-3/31/05, $54,661, "**Reinforced Masonry Engineering Handbook**."

Porter, M. L. *KPFF Consulting Engineers,* 08/16/00-09/09/10, $8,900, **"Support of Concrete Design Course."**

Support is provided for speakers, travel, supplies, and faculty salary to aid in teaching reinforced concrete design at ISU.

Porter, M. L., *Barr Engineering,* 1/1/04-12/31/08, "**Support of the Capstone Course**."

Support for the CE 485/6 capstone courses for design in civil engineering is provided by this grant. This support can be used for the reference materials, codes, and other items to support this course.

Sarkar, P. P., *National Science Foundation,* 9/15/02-8/31/05, $36,342, "**The Third U.S.-Japan Workshop on Design for Wind and Wind Hazard Mitigation**."

This award is for the support of the third joint workshop of Task Committee D (Wind Engineering) of the U.S.-Japan Cooperative Program on Natural Resources (UJNR). This workshop is an ongoing effort of the UJNR Panel on Wind and Seismic Effects to bring together U.S. and Japanese researchers from academic institutions, government laboratories, and industry to discuss the state of the art of wind effects on civil engineering structures and develop strategies and collaborative efforts that will benefit both countries. The theme of this workshop is "Reducing Losses from Wind: Collaborative Opportunities for the 21st Century" and it will be held in Seattle, U.S., on October 2–5, 2002. The purpose of this workshop is to (a) discuss previous collaborative research efforts, (b) continue mutual exchange of technical information on ongoing research, (c) identify collaborative opportunities for the 21st century and develop strategic planning that will benefit both countries, (d) identify specific projects for collaborative research, and (e) visit selected sites in the Seattle area related to wind effects on structures.

Keywords: UJNR Panel on Wind and Seismic Effects, U.S.-Japan collaboration, wind engineering

Schaefer, V. R., *National Science Foundation,* 1/1/2003 to 4/30/2005, $104,400, "**Collaborative Research: Strength of Clay Shale in Relation to Mineralogy, Micromorphology, and Pore Water Chemistry**"

Overconsolidated clays and clay shales provide engineers with some of their most challenging geotechnical problems, generally involving landslides and expansive behavior. It has been estimated that the average annual direct and indirect economic cost of landslides to public and private entities in the United States is over $3 billion in 2000 dollars. The areas most affected by landslides and expansive soils in the continental United States coincide with locations of overconsolidated clays and clay shales, including the Appalachian Mountains region, much of the prairies of the Midwest from Texas to North Dakota, and the front range of the Rocky Mountains. In recent years considerable advances have

been made in understanding the role of mineralogy and system chemistry on the behavior of overconsolidated clays and clay shales. In particular, it has been observed that weathering of the materials combined with changes in the pore water chemistry of the soil system can lead to significant reductions in the soil's strength. In this study a fundamental investigation of the physiochemical changes associated with the weathering of clay shales will be undertaken, using the Pierre shale of South Dakota as the test material. The objective is to identify changes in mineralogy, micromorphology, and pore water chemistry that accompany the weathering processes of the Pierre shale and to correlate these changes with the reduction in shear strength. If these processes are better understood, it is likely that materials susceptible to strength loss can be more readily identified and that more effective means of mitigation can be devised. Based on the conceptual understanding developed in this research, it is anticipated that recommendations for improved construction and mitigation procedures for shale slopes can be developed. Shale is one of the most commonly encountered earth materials in civil construction works. Hence, the results of this research may have a significant impact on society in terms of reduced costs associated with public works including dams, bridges, and highways, as well as private projects such as housing developments and commercial properties.

Schaefer, V. R., *Iowa Department of Transportation,* 7/1/03-12/31/04, $40,000, "**Synthesis of Nondestructive Testing Technologies for Geomaterial Applications**."

This project aims to identify, document, and selectively evaluate innovative testing technologies that can be applied to geomaterial applications. (Administered by Center for Transportation Research and Education)

Schlorholtz, S. M., *Iowa Department of Transportation,* 1/1/03-12/31/04, $25,000**"Development of In-Situ Detection Methods for Material Related Distress (MRD) in Concrete Pavements (Phase II)"**

Schlorholtz, S. M., *Federal Highway Administration,* 10/1/03-03/31/04, $25,000,**"Development of Performance Properties of Ternary Mixtures."**

Pozzolans and slag extend the market for concrete products by improving specific properties of the products, which allows the products to be constructed with materials or placed in environments that would have precluded the use of portland cement alone. In properly formulated concrete mixes, pozzolans and slag have been shown to enhance long-term strength, decrease permeability, increase durability, reduce thermal cracking of mass concrete, minimize or eliminate cracking related to alkali-silica reaction, and minimize or eliminate cracking related to sulfate attack. The purpose of this research project was to conduct a scoping study that could be used to evaluate the need for additional research in the area of supplementary cementitious materials (SCMs) that are used in concrete for highway applications. Special emphasis was given to the concept of using two or more SCMs in a single concrete mixture. The scope of the study was limited to a literature survey and panel discussions concerning issues relevant to the project. No laboratory work was conducted for this project. A problem statement with research plan was created that could be used to guide a pooled fund project. (Administered by Center for Transportation Research and Education)

Schlorholtz, S. M., *U.S. Department of Transportation,* 1/1/03-12/31/03, $100,000, **"In-situ Detection Methods of Materials Related Distress (MRD) in Concrete Pavements—Phase II."**

Schlorholtz, S. M., & Wang, K., *Iowa Department of Transportation,* 7/1/02-12/31/04, $159,666, **"Materials and Mix Optimization Procedures for PCC Pavements."**

Schlorholtz, S. M., & Wang, K., *U.S. Department of Transportation,* 9/17/02-12/31/04, $154,518, **"Materials and Mix Optimization Procedures for PCC Pavements."**

Schlorholtz, S. M., *Federal Highway Administration/Iowa Highway Research Board,* 7/1/02-12/31/04, "**Materials and Mix Optimization Procedures for PCC Pavements**."

The purposes of this project are to investigate the key parameters of concrete mixing, evaluate new field-testing methods that may be used to monitor mixing processes and control concrete quality, develop a database of information that represents the results of field evaluation of certain variables, and establish optimal mixing procedures for various materials and mixing methods/time.

Sharma, R. S., *Iowa Highway Research Board,* 1/1/04-12/31/05, "**Optimization and Management of Materials in Earthwork Construction**."

The research objectives of this project are to (1) identify the impact of not doing material optimization and management by observing existing failures in Iowa; (2) determine appropriate parameter values to consider in optimizing material placement, considering geologically diverse conditions; (3) develop guidelines for selection of materials for optimal performance; (4) demonstrate the impact by performing a test section using proposed guidelines; and (5) provide recommendations for Phase II pilot studies and development of design tools/software.

Smadi, O. G., *Iowa Department of Transportation,* 4/1/03-12/31/05, $82,322, **"County Non-FAE Paved Road Condition: Data Collection, Summary, and Delivery, Phase I."**

This work covers the effort to collect pavement condition information for the county's non-FAE paved roads using the IPMP processes and procedures.

Smadi, O. G., *Iowa Department of Transportation,* 5/1/02-6/30/03, $75,025, **"Implementation and Operation of the Iowa DOT Pavement Management Optimization Model."**

This project continues the implementation and operation of the Iowa DOT pavement management system. This phase will continue (1) automated distress data collection; (2) dTIMS support; (3) FNOS support; (4) integration of pavement management and maintenance activities; (5) general PMS support; and (6) HPMS support.

Smadi, O. G., *City of Davenport,* 06/01/99-05/31/05, $325,422, **"Local Agency Pavement Management System."**

Smadi, O. G., *Iowa Department of Transportation,* 9/1/00-12/31/04, $184,988, **"PONTIS Implementation and Operation: Iowa DOT and Counties Phase II: Implementation."**

The object of this project is to provide support to the Iowa DOT and counties to implement and operation AASHTO's PONTIS bridge management software. This phase covers implementation. Future phases will discuss operation and continued support. (Administered by Center for Transportation Research and Education)

Smadi, O. G., *Iowa Department of Transportation/Iowa Highway Research Board,* 3/1/03-9/30/03, $17,405, "**Statistical Analysis of Highway Needs Condition Data: Manual vs. Automated**."

This project examines similarities and differences between the automated condition data collected on and off county paved roads and the manual condition data collected by Iowa DOT staff in 2000 and 2001. Also, the researchers will provide staff support to the advisory committee in exploring other options to the highway need process. The results show that the automated condition data can be used in a converted highway needs process with no major differences between the two methods. Even though the foundation rating difference was significant, the foundation rating weighting factor in HWYNEEDS is minimal and should not have a major impact. In terms of RUTF formula-based distribution, the results clearly show the superiority of the condition-based analysis compared to the non-condition based. That correlation can be further enhanced by adding more distress variables to the analysis.

Souleyrette, R., *Iowa Department of Transportation,* 6/1/01-6/30/04, $92,000, **"Causation and Mitigation of High Crash Locations: Enhancing the Iowa Traffic Safety Data Service."**

The Center for Transportation Research and Education (CTRE) has established the Iowa Traffic Safety Data Service sponsored by the Iowa Governor's Traffic Safety Bureau. The Iowa DOT's Traffic and Safety Section (TAS) wishes to broaden the scope and resources of the ITSDS to address miscellaneous safety studies as identified by the TAS.

Souleyrette, R., *Minnesota Department of Transportation,* 5/1/03-12/31/99, $49,978, **"Effectiveness of all Red Clearance Time on Intersection Accidents and Violation Trends."**

Crashes at signalized intersections account for approximately 20% of all crashes both nationally and within the state of Minnesota. Past research suggests that the use of all-red clearance intervals at signalized intersections may reduce intersection crashes, particularly those related to signal violations. Other research suggests that this reduction may only be temporary. This research evaluates the safety effect of all-red clearance intervals at low speed urban 4-way intersections in the city of Minneapolis. The study includes a review of literature and assessment of Midwestern state and local practice related to the use of all-red phasing. A cross-section analysis using four years of data is presented, which does not substantiate any safety benefit of all-red phasing at study-area intersections. Several regression models (generalized linear mixed models with Poisson error distribution and log link function and linear mixed models with transformed data) are also presented. The models also point to no safety benefit. A before-and-after analysis using 11 years of

data was conducted to evaluate both short- and long-term effects. While results indicate short-term reductions in crash rates (approximately one year after the implementation), long-term reductions are not observed.

Souleyrette, R., *Iowa Department of Transportation,* 2/1/03-9/30/03, $49,982, **"Incident Location Tool Support for Delaware State Police."**

Souleyrette, R., *Iowa Department of Transportation,* 9/1/03-3/31/04, "**Incident Location Tool Support for Florida State University**."

The Center for Transportation Research and Education has developed a GIS-based incident location tool (ILT) for use with Traffic and Criminal Software (TraCS), an electronic data collection system sponsored by the Iowa DOT. Through contact with FSU, the FDOT is implementing TraCS and requires that ILT be made operational using the data formats and procedures of FDOT. CTRE proposes to implement the ILT component of TraCS for DFDO for five counties as part of a pilot study.

Souleyrette, R., *Iowa Department of Transportation,* 7/1/03-6/30/05, $59,880, "**Incident Location Tool Support for Iowa DOT Continuation**."

This is for continued development and support for ILT at the Department of Transportation. (Administered by Center for Transportation Research and Education)

Souleyrette, R., *Iowa Department of Transportation,* 5/20/02-12/31/04, $239,102, **"Iowa DOT Linear Referencing System: Linear Data Creation."**

The objective of this project is to conduct preliminary LRS data creation for a portion of the state maintained (primary) roads in the state of Iowa as well as a portion of the public roads in the central Iowa counties of Dallas, Polk, Madison, Story, and Warren.

Souleyrette, R., *Iowa Department of Public Safety,* 10/1/02-9/30/03, $75,000, **"Iowa Traffic Safety Data Service FY2003."**

Souleyrette, R., *Iowa Department of Transportation,* 7/1/03-5/14/04, $27,500, "**Traffic Monitoring Program Planning with Remote Sensing**."

This is a continuation of the change detection analysis. In this project, the methods of change detection analysis developed will be tested to see how they can be used in the Iowa Department of Transportation traffic monitoring program. (Administered by Center for Transportation Research and Education)

Sritharan, S., *Precast/Prestressed Concrete Manufacturers Association of California (PCMAC),* 1/1/02-7/31/03, $60,777, **"Design of Jointed Precast Building Systems for High Seismic Zones—Phase 1."**

Sritharan, S., & White, D. J., *Iowa Department of Transportation/Iowa Highway Research Board,* 8/15/02-8/14/04, $120,000, **"Identification of the Best Practices for the Design, Construction, and Repair of Bridge Approach Sections."**

Bridge approach settlement is a significant problem in Iowa that draws upon considerable resources for repair and maintenance at all jurisdiction levels. The problematic bump contributes not only to added expense and repair tome but also to added risk to maintenance workers, reduction in transportation agency's public image, distraction to drivers, reduced steering response, damage to vehicles, and, in the winter, damage to bridge decks from

snow plows. In order to recommend design, construction, and maintenance operations, it is important to understand the complex processes that lead to the formation of the bump. In the PI's opinion, the problem is the piles. The piles are too stiff and not strain compatible with the rest of the system. In this regard, shallow spread footings are a viable alternative to investigate.

Sritharan, S., *Precast/Prestressed Concrete Institute*, 11/1/02-4/30/04, $70,000, **"Jointed Wall System Behavior in the Press Test Building."**

Strong, K. C., *ISU Research Park,* 12/8/03-2/28/05, $16,035, **"Measuring and Predicting Improvement in Project Management and Job Closeout Productivity from Implementing an Electronic Program**."

(Administered by Institute for Physical Research and Technology)

Sung, S.-W., *Universal Entech, LLC*, 10/1/02-12/31/03, $31,981, **"Anaerobic Bioconversion of Organic Wastes to Energy and Plant Nutrients."**

The pilot study will be designed to evaluate the feasibility and design parameters of a temperature-phased anaerobic digestion process treating grocery food wastes, wastewater from a rendering plant, paunch manure, and a combination of those wastes. This study is expected to take twelve months starting in October 2002. Experimental results including biogas production rate, digester sizing information, and residual biosolid quality and quantity will be reported and used for designing a full-scale plant treating grocery food waste from Alberson Food, Inc., in Phoenix, Arizona.
Keywords: food waste, biogas, anaerobic digestion, Class A biosolids

Sung, S.-W., *U.S.-Egypt Joint Science and Technology Board,* 7/1/04-6/30/06, $20,664, **"Demonstration of Modified Septic Tank for Rural Wastewater Treatment in Egypt."**

Sung, S.-W., *U.S. Department of Agriculture,* 9/1/04-8/31/06. $20,664, **"Demonstration of Modified Septic Tank for Rural Wastewater Treatment in Egypt**."

van Leeuwen, J. H., & White, D. J., *City of Newton, Iowa*, 7/1/02-8/31/03, $10,000, **"Lime Sludge Research."**

Lime sludge generated during the lime softening process of drinking water will be tested for its suitability to replace limestone in power plants, cement kilns, acid wastewater treatment, road construction as a means of finding new materials, saving natural resources, and disposal of a waste product.

Keywords: reuse lime sludge, power generation, cement, road construction, water neutralization

van Leeuwen, J. H., *Newton Water Works/West Des Moines Water Works*, 8/1/02-08/30/03, $20,000, **"Reuse of Lime Sludges from Water Softening."**

van Leeuwen, J. H., & White, D. J., *Iowa Department of Transportation*, 8/1/01-12/31/03, $67,133, **"Reuse of Lime Sludge from Water Softening in Road Construction."**

van Leeuwen, J. H. & White D. J., *City of Ames/City of Cedar Rapids/City of Des Moines/Iowa Highway Research Board/Iowa Department of Transportation*, 7/1/01-12/31/04, $97,133, **"Reuse of Lime Sludges from Water Softening in Road Construction and Other Applications."**

Iowa has sources of water, both surface and underground supplies, that are mainly considered hard. Large quantities of lime sludge are generated during the lime softening process. The chemical composition of dried lime sludge is similar to limestone, and the overall objective is to investigate the possibility for the lime sludge to replace limestone use in a number of applications in road construction, cement manufacture, power station air pollution control, and for neutralizing acidic industrial wastewaters.

Keywords: water softening sludge reuse, power stations, SO2 scrubbing, cement manufacture, neutralization, road construction

Wang, K., *National Science Foundation*, 3/15/03-2/28/05, $20,000, **"Conducting an International Workshop on Sustainable Development and Concrete Technology."**

There is increasing concern about issues such as global warming and other ecological changes that have drastically influenced the existence of life. The concrete industry is considered one of the significant contributors to these changes. With the exponential growth of the human population and industrialization, concrete is now used not only for buildings and roads but also for other civil infrastructure facilities such as underground mass transit facilities, wastewater treatment systems, and marine structures. Every year, approximately 1.6 billion tons of portland cement are produced worldwide, generating 5% of the global carbon dioxide (CO2) emission. Annually, the concrete industry consumes 10 billion tons of sand and rock and 1 billion tons of water. Concrete greatly impacts the ecology of the planet earth. The purpose of this project is to conduct an international workshop to address the above issues. The workshop will be hosted by Tsinghua University, in collaboration with other organizations. The goals of the workshop are to promote global interaction and foster research collaboration so as to develop a better understanding toward sustainable development using concrete technology. A steering committee, consisting of members from both the U.S. and China, will be formed for the workshop organization and implementation. U.S. experts, especially women or minorities, on cement and concrete materials will be invited to the workshop, eight to ten of whom will be selected by the workshop committee and partially be supported by the NSF travel grant. The China Building Material Academy will sponsor and jointly host the workshop with Tsinghua University. The Yangtze Survey, Planning, and Design Research Institute will co-sponsor the workshop. China Yangtze Power Corporation Ltd. will host and sponsor a field trip to Three Gorges. A proceeding of the workshop will be produced.

Wang, K., *University of Iowa/Iowa Highway Research Board/PCC Center*, 5/1/02-4/30/04, $12,813, **"Evaluation of Using Non-corrosive Deicing Materials and Corrosion-reducing Treatments for Deicing Salts."**

The purpose of this research is to investigate interactions between selected deicing chemicals and portland cement concrete. These interactions include chemical reaction between deicer and concrete component, mineral precipitation and crystal growth in concrete pore spaces, and corrosion of concrete steel reinforcement. These processes are known

to cause concrete scaling and deterioration and have a serious economic impact due to necessary repair of damaged highways.

White, D. J., *Geopier Foundation Company*, 12/6/01-12/31/99, $6,000, **"A Numerical Investigation of Settlement Reduction in Widening of Road Embankments Using the Geopier and Geogrid Foundation Systems."**

White, D. J., *U.S. Department of Transportation*, 8/16/02-11/30/04, $40,000, **"Field Trials and Technology Transfer: Ash Stabilization of Non-uniform Subgrade Soils."**

White, D. J., *Iowa Department of Transportation/Iowa Highway Research Board*, 3/1/03-9/1/05, $198,462, **"Innovative Solutions for Slope Stability Reinforcement and Characterization in Iowa Soils."**

This research will include in-situ testing of (5–10) existing slope failures around the state. The BST will be the primary testing device used in this regard. Field investigations will provide for a better understanding of the mode of failure associated with most stability problems in Iowa. Coincident with investigation of failures, remediation technologies will be investigated and select pilot studies will be conducted as opportunities are presented. (Administered by Center for Transportation Research and Education)

White, D. J., *ISG Resources, Inc.*, 1/1/88-12/31/99, $614,775, **"Iowa Fly Ash Affiliate Research Program."**

White, D. J., *Iowa Department of Transportation*, 3/1/03-9/1/05, $198,462, **"Slope Stability Evaluation and Remediation Techniques for Iowa."**

White, D. J., *Iowa Department of Transportation; Federal Highway Administration; Iowa Fly Ash Association; Iowa Highway Research Board; PCC Center*, 7/1/01-11/30/04, **"Soil Stabilization of Non-Uniform Subgrade Soils."**

To determine, from field test sections and laboratory testing, how various raw ash types, hydrated fly ashes (HFA) and conditioned fly ashes (CFA) in combination with the wide range of Iowa soil types will bring about desirable engineering properties and provide uniform properties for subgrade strength and stiffness.

White, D. J., *Alliant Energy*, 10/31/01-9/9/10, $4,105, **"Unrestricted Support for Research."**

White, D. J., *Alliant Energy*, 1/1/03-12/31/99, $13,600, **"Utilization of Coal Combustion By-products in Civil Engineering Construction Applications."**

White, D. J., *Ames Municipal Electric System*, 1/1/03-12/31/03, $3,400, "**Utilization of Coal Combustion By-products in Civil Engineering Construction Applications**."

White, D. J., *Martin Marietta Aggregates*, 6/1/03-5/31/05, $24,000, **"A Pilot Study to Investigate the Use of Aggregate Screenings in Roadway Construction"**

Martin Marietta is planning to build a new quarry access road near Cedar Rapids. This provides an excellent opportunity to conduct the project's pilot testing and research, which will include material analysis, design procedures, construction operations, and evaluation of test sections of new flexible pavement supported by two to three different aggregate screening materials as the base. Test sections will consist of untreated and treated screenings and be evaluated for performance over a five-year

period. (Administered by Center for Transportation Research and Education).

Wipf, T. J., *Department of Agriculture--Forest Service*, 3/14/2002 to 3/31/2005, $246,037, **"Development of Acceptable Live Load Deflection Criteria for Various Timber Superstructure and Deck Types."**

Deflection criteria typically used in the design of highway bridges are currently based on arbitrary limits. Although the need for having deflection limits is undisputed, there exists a need for live load defection criteria for timber superstructures and decks based on actual structural behavior, performance of wearing surfaces, and user perception. In addition, current deflection limits are based solely on total deflection. However, past experience has shown that differential deflection may be a more important parameter. As a result, a need exists for research related to the importance of and allowable limits for differential deflections as they relate to the long-term performance of timber bridges. Project features include the following: (1) completion of a survey of state and local bridge owners on the use of live load deflection criteria; (2) field testing and in-depth condition assessment of 20–30 timber bridges with varying superstructure and deck types; (3) analytical modeling and extrapolation of timber bridges for a sensitivity analysis; and (4) development of deflection criteria (e.g., total, differential) based on results of field testing and analytical modeling.

Wipf, T. J., *Iowa Department of Transportation*, 11/1/01-10/31/03, $59,893, **"Evaluation of a Post-Tension Strengthened Steel Girder Bridge Using FRP Rods/Strands."**

Many state, county, and local agencies are faced with deteriorating bridge infrastructure composed of a large percentage of relatively short- to medium-span bridges. In many cases, these older structures are rolled or welded longitudinal steel stringers acting compositely with a reinforced concrete deck. Most of these bridges, although still in service, need some level of strengthening due to increases in legal live loads or loss of capacity due to deterioration. Although these bridges are overstressed in most instances, they do not warrant replacement; thus, structurally efficient but cost-effective means of strengthening needs to be employed. In the past, the use of bolted steel cover plates or angles was a common retrofit option for strengthening such bridges. However, the time and labor involved to attach such a strengthening system can sometimes be prohibitive. This project was funded through the Federal Highway Administration's Innovative Bridge Research and Construction program. The goal is to retrofit an existing structurally deficient, three-span continuous steel stringer bridge using an innovative technique that involves the application of post-tensioning forces; the post-tensioning forces were applied using fiber reinforced polymer post-tensioning bars. When compared to other strengthening methods, the use of carbon fiber-reinforced polymer composite materials is very appealing in that they are highly resistant to corrosion, have a low weight, and have a high tensile strength. Before the post-tensioning system was installed, a diagnostic load test was conducted on the subject bridge to establish a baseline behavior of the unstrengthened bridge. During the process of installing the post-tensioning hardware and stressing the system, both the bridge and the post-tensioning system were monitored. The installation of the hardware was followed by a follow-up diagnostic load test to assess the effectiveness of the post-tensioning strengthening system. Additional load tests were performed over a period of

two years to identify any changes in the strengthening system with time. Laboratory testing of several typical carbon fiber-reinforced polymer bar specimens was also conducted to more thoroughly understand their behavior.

Wipf, T. J., *Wapello County*, 7/1/03-12/31/06, $166,378, **"Evaluation of a Prestressed Concrete Bridge Constructed Using Ultra High-performance Concrete."**

The purpose of this project is to allow the innovative material performance evaluation and preliminary engineering of a bridge in Wapello County constructed of UHPC. (Administered by Center for Transportation Research and Education)

Wipf, T. J., *Delaware County*, 4/1/03-3/31/07, $60,036, **"Evaluation of a Timber Bridge for the Secondary Road System Using FRP-reinforced Glulam Girders**."

Glued laminated wood (glulam) has been used in construction for over 100 years. The development had originally been encouraged because of the lack of adequate solid timbers. Glulam can be fabricated in many shapes and sizes and has been used significantly since 1942 for building and bridge construction, including both bridge girders and bridge decks. Glulam, like reinforced concrete, can be reinforced in the tension regions to more effectively use the compressive strength of the wood, which allows lower-grade wood to be used. Fiber reinforced polymers (FRP) have been shown to be effective in reinforcing the tension regions of glulam girders. With falling costs for the FRP material and the development of efficient manufacturing techniques, the FRP-reinforced glulam has the potential to be an economically viable bridge alternative. The purpose of the bridge application is to construct a single span bridge in Delaware County, Iowa, that is owned by the county. The candidate bridge has a span length of 75 feet and a width of 30 feet. The bridge will be comprised of FRP-reinforced glulam girders and will use a transverse timber deck. The design will be based on recommendations and performance data supplied by the eventual manufacturer. The Bridge Engineering Center is documenting the design, construction, and performance of this bridge. Project features include the comparison of design performance parameters with field-measured performance and long-term evaluation of the FRP-to-timber interface integrity. (Administered by Center for Transportation Research and Education)

Wipf, T. J., *U.S. Department of Agriculture--Forest Service*, 1/1/02-12/31/04, **"Evaluation of the Effectiveness of Glued Laminated Helper Stringers**."

The objective of this project was to evaluate the effectiveness and usefulness of using glued laminated (glulam) timber stringers as helper stringers to add strength and stiffness to an existing timber railroad bridge. The scope includes loading the bridge and measuring deflection of the bridge both before and after the addition of the glulam stringers to determine the percent increase in stiffness caused by the helper stringers, as well as their effect on load sharing between individual stringers. The test bridge is located on a Puget Sound and Pacific Railroad Company (PSP) rail line between Centralia and Elma, Washington. This rail line serves the PSP headquarters in Elma via Centralia and southern Washington running parallel to State Highway 12. The bridge is an eight-span, 114-ft.-6-in., continuous timber bridge crossing Gibson Creek at milepost 38.8. Project features include documenting the installation of the helper stringers and testing the bridge, under known loads, to determine the effectiveness of the helper stringers.

Wipf, T. J., *Iowa Department of Transportation*, 7/1/03-6/30/04, $40,150, **"In-service Training for the Iowa DOT Office of Bridges and Structures, FY04."**

Wipf, T. J., *Iowa Department of Transportation/Iowa Highway Research Board*, 5/1/01-6/1/03, **"Maintenance, Repair, and Rehabilitation of Low-volume Road Bridges**."

Most states, including Iowa, have a significant number of substandard bridges. This number will increase significantly unless some type of preventative maintenance is employed. Both the Iowa Department of Transportation and Iowa counties have successfully employed numerous maintenance, repair, and rehabilitation (MR&R) strategies for correcting various types of deficiencies. However, successfully employed MR&R procedures are often not systematically documented or defined for those involved in bridge maintenance. This study addressed the need for a standard bridge maintenance, repair, and rehabilitation (MR&R) manual for Iowa with emphasis on secondary road applications. A significant component of this manual is associated with timber bridges. Bridge MR&R activities that are relevant to the state of Iowa have been systematically categorized into a manual, in a standardized format. Where pertinent, design guidelines have been presented. Material presented in this manual is divided into two major categories: (1) repair and rehabilitation of bridge superstructure components, including timber substructures; and (2) repair and rehabilitation of bridge substructure components. There are multiple subcategories within both major categories that provide detailed information. Some of the detailed information includes step-by-step procedures for accomplishing MR&R activities, material specifications, and detailed drawings where available. The source of information contained in the manual came from public domain technical literature and from information provided by Iowa county engineers.