

Senior Design Project Soars at Daytona Competition



Senior designers **Bekah Puterbaugh**, **Andy Fleming**, and **Greg Palm**, pose with their advisor, Professor **Scott Thomas**, behind their radio-controlled aircraft in the Russ Atrium.

Three senior students from the Department of Mechanical and Materials Engineering at Wright State University entered their airplane in the SAE AeroDesign Competition in Daytona Beach, Florida, which ran from April 15 to April 18, 2004, at the Deland Radio Control Club airstrip.

As part of their Senior Design project, Andy Fleming, Bekah Puterbaugh and Greg Palm designed and built a radio-controlled aircraft from scratch starting in January 2004. Their advisor was Prof. Scott Thomas.

The competition tested the team's ability to predict the performance of their original design as well as to determine how much weight their aircraft could carry aloft from a 200-foot takeoff limit, around a prescribed course and return to land within a 400-foot limit on the same airstrip.

The competition was divided into two parts: design and flight. In the design event, the contestants presented their design strategy and demonstrated the accuracy

of their calculations in predicting the maximum payload the aircraft could lift. The flight event determined which aircraft could lift the most weight.

The basic requirements for the contest were as follows: The wingspan could not be smaller than 120 inches. The minimum cargo volume was prescribed such that the aircraft had to be capable of carrying and fully enclosing a rectangular block measuring 6 inches by 5 inches by 4 inches. The required engine was a single, unmodified O.S. .61FX with E-4010 muffler.

Even though the students started the project in January, they were able to fly their plane several times prior to the competition.

The WSU team came in fifth out of 35 university teams who traveled from as far as Michigan, New Jersey and Brazil. The competition was very intense.

After the first round of competition, WSU was in third place overall. After the third round (when their

rear landing gear collapsed and the airplane pancaked onto the runway), they dropped to seventh place. The students made the necessary repairs, and increased the payload weight by two pounds in the next round.

In the final round, they increased the payload weight by another two pounds up to 23.5 pounds, were able to lift off successfully, fly gracefully around the circuit, and put it back down on the deck. Unfortunately, the tail cracked and dropped down. Fortunately, the judges said that the round would count, since the students were able to lift the entire plane off the ground as a single (but broken) unit.

Interestingly, during that last round there were about a dozen

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FACULTY FACTS

Below is a □
by our faculty.

Bourbakis, Nikolaos G. (ITRI)
Brandeberry, James E. (CECS)
Priorities in Graduate Education
Ohio Board of Regents
7/1/03-6/30/04.....\$130,480

Grandhi, Ramana V. (MME)
Penmetsa, Ravi C. (MME)
Multidisciplinary Design Optimization for High Reliability and Robustness
Department of Defense, Office of Naval Research
10/1/02-9/30/05.....\$36,459

Golshani, Forouzan (CSE)
Priorities in Graduate Education (Computer Science)
Ohio Board of Regents
7/1/03-6/30/04.....\$182,420

Emmert, John (EE)
Hardware Design of Real Time, Highly Adaptable Control for Intelligent Radio Frequency Front Ends
Department of Defense, Air Force Research Laboratory
6/27/02-6/30/05.....\$150,000

Hangartner, Thomas N. (BIE)
Evaluation of a Novel Treatment for Osteoarthritis of the Knee
Proctor & Gamble Company
8/6/99-9/30/05.....\$14,674

Hangartner, Thomas N. (BIE)
Postmenopausal Evaluation and Risk Reduction
Pfizer
1/1/02-12/31/04.....\$1,216

Hill, Raymond (BIE)
Narayanan, Sundaram (BIE)
Coordination and Control of Cooperative Swarms of Unmanned Aerial Combat Vehicles via a Virtual Testbed Environment
Department of Defense, Air Force Office of Scientific Research (AFOSR)
3/15/04-3/14/05.....\$138,742

Hill, Raymond (BIE)
Quantifying the Cost of Spatial Disorientation on Air Force Aerial Operations
General Dynamics (formerly Veridian Engineering)
2/1/04-3/14/05.....\$138,742

Hong, Lang (EE)
Robust Feature-Aided Tracking
MRLets Technologies, Inc.
5/1/03-6/30/05.....\$80,000

Misra, Pradeep (EE)
Holistic Numerical Methods
University of South Florida
3/1/04-2/28/05.....\$14,653

Phillips, Chandler A. (BIE)
REU Supplement – Bioengineering Design Projects for Persons with Disabilities
National Science Foundation, Research Experiences for Undergraduates
1/1/04-6/30/04.....\$6,000

Shang, Joseph J.S.
Investigation of Microwave Attenuation in Plasma
Department of Defense, Air Force Office of Scientific Research (AFOSR)
1/1/03-12/31/04.....\$167,502

Wolff, J. Mitch
Gas Turbine Engine Sensor Technologies
Ohio Aerospace Institute
3/15/04-3/18/05.....\$5,000

Wolff, J. Mitch
Dynamic Test of Pressure Sensors
National Aeronautics and Space Administration
2/21/04-9/30/04.....\$15,000

Wolff, J. Mitch
Computational Aerothermodynamics
Department of Defense, Air Force, Air Force Research Laboratory
9/30/02-9/29/07.....\$130,000

Winter Dean's List continued from page 2

PRE-BIOMEDICAL ENGINEERING

Amanda Darrah	High Honors
Ryan Foster	Highest Honors
Christina Schrider	Honors
Jason Scott	Honors

PRE-COMPUTER ENGINEERING

Justin Chevront	Honors
Daniel Garling	Highest Honors
Brandon Reinhart	Highest Honors
Thomas Riddle	High Honors
William Schindel	Highest Honors
Matthew Spencer	Honors
Brad Turner	Honors
Toshia Wenning	High Honors

PRE-COMPUTER SCIENCE

Chris Borland	Highest Honors
Jesse Corns	High Honors

James Dagg	Highest Honors
Robert Hoos	Highest Honors
Daniel Klima	Highest Honors
Matthew Maloney	Highest Honors
Andrew Maneri	Honors
Brandon Mills	High Honors
Benjamin Murray	Highest Honors
Gregory Parks	High Honors
James Uphaus	Highest Honors

PRE-ELECTRICAL ENGINEERING

Nicholas Baine	Highest Honors
Bartholomew Bischoff	High Honors
Christopher Cummings	High Honors
Nicholas Gale	Highest Honors
Shawn Gargac	Highest Honors
Terry Kolakowski	Highest Honors
Alicia Lawrence	High Honors
Tony Ling	Honors
Andrew Lingg	Honors
Kevin Scholl	High Honors

Wesley Warf	Highest Honors
Adam Webb	Highest Honors
Paul Webb II	Highest Honors
Anne Zelnio	High Honors

PRE-ENGINEERING PHYSICS

Nick Chenoweth	Honors
Charles Phelps	Honors

PRE-MECHANICAL ENGINEERING

Carlin Lucente	Highest Honors
Eric Weber	Highest Honors

CONGRATULATIONS ON YOUR
ACADEMIC EXCELLENCE!!

College of Engineering and Computer Science Annual Recognition and Awards Ceremony

Friday, June 11, 2004
4:30 pm

Student Union Multipurpose Room

Join us as we honor outstanding students, faculty, and friends.

Reception immediately following the ceremony.

Don't forget to RSVP by **May 28th** to (937)775-5001 or email jgarring@cs.wright.edu.

BITs & PCs

College of Engineering and Computer Science
Wright State University



Dean

James E. Brandeberry, Ph.D, P.E.

Managing Editor

Jenny Garringer

Editor

Samantha Hundt

BITs & PCs is a monthly newsletter published by the College of Engineering and Computer Science to inform students about activities, news, opportunities and changes occurring in the College. It reports on the achievements of faculty and students; changes in organization, policy and curriculum; scholarship and employment opportunities; and engineering and computer science student club activities.

The current issue of *BITs & PCs* is available on the Web at <http://www.cs.wright.edu/bitsandpcs/>. Copies are also available in the College office, any Department office, literature rack in the Russ Center Atrium, Russ Center Study Lounge, or the Student Club Room.

The next issue of *BITs & PCs* will be published the week of May 31, 2004. To submit items for this issue, call the College of Engineering and Computer Science at (937) 775-5001, or send email to jgarring@cs.wright.edu by May 17, 2004. The College of Engineering and Computer Science reserves the right to edit all material for publication.

CECS Research Works to Give 'Eyes' to Blind

Tyflos

Nikolaos Bourbakis



Dr. Nikolaos Bourbakis models a pair of glasses mounted with a Tyflos camera system.

CECS researchers have been designing equipment which can help blind individuals complete day-to-day tasks such as reading, participating in class, and interacting with friends.

Dr. Nikolaos Bourbakis, director of the Information Technology Research Institute, is the principle investigator in this collaborative effort with Arizona State University (ASU). Dr. Bourbakis has been involved in computer engineering-related eye research for the past 20 years.

Tyflos, which is Greek for blind, is the name of the portable model at Wright State that identifies objects, words and people and then translates them into auditory information.

A small camera attached to a pair of glasses sees the objects in front of it. The camera is

wired to a specialized laptop in a backpack, and this laptop matches the image received with those in a database. When a match is made, the computer translates this information into audio, which is transmitted to the wearer. A small microphone allows the user to request certain information, such as: *Who just entered the room?* or *What is in front of me?* Tyflos can also be set to relay continuous information to the user about the environment.

The ASU counterpart to Tyflos, dubbed iLearn, is a stationary system. It can read text at the speed of a live speaker and is better suited for use in environments such as libraries or offices.

Wright State's system, with its portability, may be more helpful for daily activities which seeing people take for granted. Tyflos can help the blind become more independently mobile and help them interact in social situations without relying on information from another person. With the help of the image recognition on their back, they can recognize a person immediately, and initiate a conversation, rather than waiting to be approached.

Dr. Bourbakis is currently working on several extensions to the Tyflos project. One will assist users in navigating within their environment.

Dr. Bourbakis has tested Tyflos using two systems. One uses two cameras, while the other uses a single camera along with a scanner. Inputting data from two sources allows for three-dimensional information, which is essential for navigation.

Two other extensions, in their early stages at this point, would aid users in drawing and writing tasks, allowing them to explore new aesthetic horizons.

Dr. Bourbakis hopes to collaborate with Wright State's Office of Disability Services to test Tyflos on campus.

The collaborative project, begun in 1995, is in its ninth year. Last fall it received an additional \$1.1 million in funding from the National Science Foundation, to be utilized over a four-year time period.

FACULTY SPOTLIGHT

MME Professor Wins Regional Teaching Award

Dr. Nathan Klingbeil
Department of Mechanical and Materials Engineering

Spring Quarter Courses: ME414/614 - Mechanical Design I, ME890 - Advanced Mechanics of Solids

Dr. Nathan Klingbeil, Assistant Professor of Mechanical Engineering, has received the American Society of Engineering Education - North Central Section Outstanding Teaching Award.

The society honored Dr. Klingbeil at the ASEE NCS Spring Conference at Western Michigan University in Kalamazoo on April 2, 2004.

Dr. Klingbeil was nominated by Dean Brandeberry for his excellent interaction with his students and his continued dedication to engineering education. He receives constant superior evaluations from his students.

"Dr. Klingbeil's notes are better than the textbook," said one student, "he explains everything to perfection."

"Because I learn a lot and understand what he teaches," said another, "I will schedule my other classes around the class he's teaching."

Along with a great teaching record, Dr. Klingbeil has a history of improving the administration of engineering education.

He is the lead investigator of a National Model for Engineering Education, a National Science Foundation grant project to restructure the engineering curriculum and improve retention.

This project includes the implementation of a new freshman engineering mathematics course, EGR 101.

He has also developed a new graduate level mechanics course, ME890 Advanced Mechanics of Solids II, to support the Ph.D. in



Dr. Nathan Klingbeil

Engineering Program.

In addition, he has been involved in the development of program material for the Academic Advantage Program at Wright State, and served as an instructor. This program introduces first year students to the basics of engineering before the school year begins.

In addition to these accomplishments, Dr. Klingbeil has received over \$525,000 in research funding. He has also been nominated for the CECS Excellence in Teaching Award every year he has been eligible, and received the award in 2002. In 2003, he received the CECS Early Career Achievement Award.

Dr. Klingbeil graduated with a bachelor's degree in Mechanical Engineering from the University of Dayton in 1993. He received his Master's and Ph.D. in Mechanical Engineering from Carnegie Mellon University in 1995 and 1998, respectively.

Order of the Engineer Ring Ceremony



The Order of the Engineer (OOE) was established to promote professionalism among engineers and graduates of

accredited engineering programs. The College of Engineering and Computer Science holds two induction ceremonies each year, one at the end of fall quarter and one at the end of spring quarter.

The next induction ceremony will be held on **Friday, June 11, 2004 at 7:00 PM** in the Student Union Multipurpose Room. Engineering seniors graduating in June 2004 or August 2004, graduate students, alumni, and faculty are encouraged to register and participate.

The \$10 registration fee covers membership and the steel ring. Registration and fees must be received by the Office of Conferences and Events no later than **May 28th**.

For a registration form or more information about OOE or the ring ceremony, visit the "What's New" link on the College homepage at www.cs.wright.edu or contact the Dean's Office at **(937) 775-5001**.

Campus Autocrosses

The student section of the Society of Automotive Engineers and the Western Ohio Region of the Sports Car Club of America (SCCA) will host autocrosses, to be held on May 9, May 23, June 13, July 25, August 22, September 19, and October 17. Registration is required for drivers and spectators. The approximate cost of driver registration will be \$20 for SCCA members and \$25 for non-members. For safety, Campus Police will be at the autocrosses. Fairborn Fire, Rescue, and EMT will be on call. Alcohol is prohibited at autocrosses.

For more details visit www.worscca.org, or contact Jason Kremer, Justin Rausch, Greg Wilt, or Professor Hannen in room 022 Russ, or at **775-5183**.

SCHOLARSHIPS & FELLOWSHIPS

Described below are scholarship and fellowship programs available to CECS students

The **US Navy** is looking for bright, well-rounded engineers to participate in its *Nuclear Propulsion Officer Candidate* (NUPOC) program. Those interested may apply as early as the second semester of their sophomore year, and as late as post-graduation, and must attend a personal interview with a Navy Admiral. Accepted applicants will train to be officers and leaders on-board the Navy's nuclear carriers and submarines. Benefits include:

- \$10,000 signing bonus
- Military pay while you complete your education at WSU
- Competitive salary with guaranteed pay increases as you advance in rank
- Full medical and dental insurance
- 30 days paid vacation per year
- Postgraduate education opportunities

In addition to the NUPOC program, the Navy is also offering positions for qualified individuals teaching at the Nuclear Power School in Charleston, SC. Participants would be commissioned officers in the US Navy, with no sea duty obligation. For information please contact Lieutenant, junior grade, Teri Lawson at 800-553-1146 ext. 127, or e-mail her at lawsont@cnrc.navy.mil.

The **Associated General Contractors of Ohio Education Foundation** currently has several scholarships available geared toward students pursuing construction-related degrees. All students applying must be U.S. citizens, have a 2.5 GPA (out of 4.0) and be an undergraduate in at least the second year of a construction related degree program during the 2004-2005 academic year. For applications and more information on the many scholarships available through this program, please visit 405 Russ or go to www.agcoho.com

The **Naval Research Laboratory (NRL)** sponsors a postdoctoral fellowship program that is designed to increase the participation of highly trained scientists and engineers in scientific and technical areas of interest in the Navy. Scientists and engineers at participating naval laboratories help shape and execute the programs that support Naval Forces in their future operational needs. Competitive stipends based on experience are offered.

Relocation and travel allowances along with a comprehensive benefits package including health, life, and disability insurance are also offered. All applicants must be U.S. citizens or permanent residents, or must hold a green card. Permanent resident status eligibility for fellowship positions may vary with each laboratory. Before appointment, each participant must present evidence of having received a Ph.D. or equivalent degree. The applicant must submit a 5-10 page research proposal that relates to a specific research opportunity. Applications are accepted on an ongoing basis. For application material and detailed information, visit www.asee.org/nrl.

The **National Science Foundation** is offering \$30,000 RAISE graduate fellowships, accompanied by full tuition, to six qualified mechanical or civil engineering students accepted to Polytechnic University. The position begins on June 1, 2004. Fellows spend ten hours per week at a high school site and five hours per week in preparation, serving as a science resource by designing and conducting sensor-based experiments. They will develop and conduct technology workshops for high school teacher, and collaborate with them to prepare lab activities. They will also conduct research in faculty directed projects in their field. Fellows must maintain a full load of graduate study and demonstrate progress toward their assigned thesis/dissertation research. More information is available at <http://gk12.poly.edu>.

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aircraft still operational, so no one knew who won until the very end.

The WSU team received a great deal of positive comments from the other students, faculty members and retired radio-controlled modelers concerning the quality of their plane in terms of construction and appearance.

In addition, a huge amount of excitement was generated in the crowd when the AMA-certified pilot flying the WSU airplane, Mr. Eddy Noble of Urbana, would fly the craft. From the beginning, he said his approach would be to fly low and slow, as opposed to the rest of the competition, who flew high and fast, which made for some very dramatic flights. Eddy's flying skills were spectacular, even in the face of 15-knot cross-wind gusts.

The WSU team witnessed quite a few heart-wrenching crashes, inspected a lot of excellent aircraft designs, and met many interesting and friendly engineering students and faculty. The professionalism of the entire group was evident, because after every flight (good or bad), the students, faculty and other on-lookers all gave the team a hearty round of applause.

The intensity of this year's WSU team was formidable: They never despaired, always kept a positive outlook, and were in the competition to win until the very end. The WSU team learned a great deal about aircraft, aeronautics, project management, and how to work effectively in a team environment.

The next step is for the students to rebuild the airplane to show it at the CECS Awards Ceremony at the end of Spring quarter, and to give a flying demonstration for their fellow Senior Design students.

The WSU team would like to thank Dean Brandeberry for his generous support during this project, and they would also like to thank all of their colleagues and friends who gave a lot of good advice on aircraft construction and aerodynamics.

Anyone interested in becoming part of next year's team should contact Dr. Scott Thomas at (937) 775-5142 or via e-mail at scott.thomas@wright.edu. Further information, including photos and short film clips, is available at <http://www.cs.wright.edu/people/faculty/sthomas/saeero.html>

UPCOMING

PH.D. IN ENGINEERING DISSERTATION DEFENSE:

Karl Gudmundsson

Date: Friday, May 14

Time: 1:00 pm

Room: 311A

Dissertation Title:

*Multi Dimensional Tracking,
Classification and Training Using
Phase Only Filter Pattern Classifier*

Advisor: Dr. Kazimierczuk

EMPLOYMENT OPPORTUNITIES

SOCHE Student Research Program

Research opportunities at Materials Lab and AFIT at WPAFB

Flexible work schedules, e.g., 12-14 hrs. wk. academic year & 40 hrs. wk. summer; full-time alternating terms; or 20 hrs. wk. year round - we will work with you!

Career related work experience - state-of-the-art labs

Earn while you learn (Soph. \$11.70 hr; Jr. \$13.15 hr; Sr. \$14.50 hr; Grad. \$17.90 hr; PhD \$21.60 hr)

Undergraduate to graduate students

Degree seeking students in good standing

Must be a U.S. Citizen

No experience necessary

The SOCHE Student Research Program is accepting applications for positions at WPAFB for the following majors:

Chemistry, Computer Science, Electrical Engineering, Materials Science, Mechanical Engineering, Math, and Physics

SOCHE accepts applications on an on-going basis for current and future job openings. Below is a sample of the positions we offer.

Reverse Engineering of Gene Networks

Majors - Electrical Engineering, Mechanical Engineering (with strong math background)

This research responds to an Air Force need to understand toxicology at the cellular level. There is an ongoing research effort at AFRL in the area of toxicogenomics, which has been proposed to be a substantial part of the biotechnology research at AFRL in the future. One way to gain a better understanding of toxicology at the cellular level is to develop quantitative models of the cellular pathways involved with the cell's response to exposure to a toxic chemical. Models of various pathways and methods to determine the rate constants as well as other relevant parameters for models of pathways have recently appeared in the literature, but are not concerned with the particular pathways associated with the toxicology of hydrazine or cadmium, both of which are of interest to the Air Force. This research effort is concerned with supporting the toxicogenomics work at

AFRL through the development of models of one or more of the pathways associated with liver cell's exposure to hydrazine and/or cadmium and the development of methods to estimate the rate parameters in the models so as to obtain agreement with available genomic and proteomic data. The particular research of this effort is involved with the implementation and use of existing tools for extracting, analyzing and visualizing genomic data, with the modeling of intra-cellular pathways with systems of differential equations, and with the determination of the parameters associated with the system of differential equations by comparing the predictions of the models with existing experimental data.

AIM Phase Field Code Development

Majors - Computer Science, Materials Science, Mechanical Engineering

This involves writing, testing, and documenting and new methods in the codebase to (1) add new features as determined by AFRL scientists, (2) to add new functionality, and (3) improve reliability. The codebase itself is a mixture of legacy FORTRAN code and newer C code that uses several Application Programmer Interfaces to do mathematical computations, multimedia input and output, and xml input and output.

Nanosopic Surface Preparation and Sensor Materials Characterization

Majors - Physics, Chemistry, Materials Science

Description - Methods to influence the organization of atoms at the surface and interface of materials will be investigated. This work may include the deposition of materials, the operation of materials characterization equipment (X-ray, electron and/or ion spectroscopy, AFM, etc.) under the direction of senior engineers to determine the chemistry, morphology and/or structure of the deposited materials, as well as, the design or modification of software on lab automation or data reduction computer systems.

Atomistic and Continuum Modeling of Quantum Dot Structures

Majors - Physics, Electrical Engineering, Materials Science, Computer Science

Description - Perform finite element calculations to determine the minimum energy

shape of quantum dots as a function of dot volume, using commercially available finite element software. Repeat these calculations at the atomic level by performing molecular dynamics calculation using a valence force field (VFF) potential. Develop this molecular dynamics code in MATLAB.

Electromagnetic Simulation

Majors - Electrical Engineering, Physics, Math

Description - The student will help predict and characterize peak VHF radar cross section of targets on a dielectric ground as a function of target orientation and surface moisture. The student will develop computer code to form synthetic aperture radar (SAR) images from simulated data. The student will also compare radar images from predicted data to real world radar images in order to spot-validate prediction models. In addition, the student will characterize peak RCS as a function of target orientation for both simulated and real world radar images.

New Defenses Against Steganography Major - Computer Science

Description - Steganography may be used to encode a hidden message in a digital image without apparent effects on the image. However, subtle effects are present, and they may be detected using new techniques based on optimal roughness and related metrics. This research will investigate these techniques for detecting, resisting, and otherwise defending against steganography and related information warfare attacks, and it will evaluate their effectiveness relative to existing methods. Specific tasks include the following (1) acquire a database of images that contain steganographic messages with various known encodings, (2) develop candidate procedures that employ optimal roughness and related metrics to detect steganographic encoding or to prophylactically resist such encoding, and (3) evaluate the effectiveness and robustness of the optimal roughness techniques relative to existing methods.

Submit:

SOCHE Application
(available at www.soche.org)
Resume & Transcript/Advising Report

For more information
Call 937-258-8894

Inventors Competition accepting applications

Each year the National Inventors Hall of Fame presents the Collegiate Inventors Competition to recognize and encourage student involvement in the manifestation of technology breakthroughs.

The United States Patent and Trademark Office sponsors the annual event, which awards students for their contributions to enhancing technology.

Awards include a \$50,000 Grand Prize, a \$25,000 Graduate Student Award, a \$15,000 Undergraduate Student Award, and a \$5,000 honorarium presented to the advisor of each winning project.

Students may enter individually or in teams of up to four students. At least one student must have been enrolled full-time at a college or university within 12 months prior to the entry date and all team members must have been enrolled part-time or better within the past 24 months.

Entries are judged based on originality and inventiveness, as well as the social, economic, and environmental value of the new idea, and the scope of its use.

Final judging takes place in November, when finalists must attend the final judging session and awards presentation in Washington, D.C. Here, judges and finalists will have the opportunity to meet face to face and answer any questions that may have arisen about the projects. Winners will be presented at a ceremony immediately following this final judging. Winners must be present at the judging and the awards ceremony in order to claim their prizes.

The deadline to apply for the 2004 competition is June 1, 2004. For additional information and a downloadable application packet, please visit www.invent.org/collegiate. To recommend someone for an award, send an email to collegiate@invent.org or call (330) 849-6887.

Important Dates

May 25	Last day to apply for August graduation
May 31	UNIVERSITY CLOSED - Memorial Day
June 5	Last day of spring quarter classes
June 7-12	Final examinations
June 11	CECS Awards Ceremony - 4:30 PM Order of the Engineer Ring Ceremony - 7:00 PM
June 12	Spring Quarter Commencement
June 14	First day of A and C term summer quarter classes
July 15	Last day of A term classes
July 19	First day of B term summer quarter classes
August 9	Last day of B and C term classes
August 21	Last day to apply for December graduation

Office of the Dean

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College of Engineering and Computer Science

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