



BITs & PCs

COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

June 2000 Wright State University Dayton, Ohio 45435 Vol. 16 No. 6

Garber Appointed Chair of Electrical Engineering Department

The College of Engineering and Computer Science is proud to announce that Frederick Garber has been appointed Chair of the Department of Electrical Engineering. Dr. Garber received degrees in electrical engineering from the University of Illinois—a Ph.D. in 1983 and M.S. in 1978—and a B.S. in electrical engineering from Tri-State University in 1975.



Prior to joining the faculty at Wright State University in August 1990, Dr. Garber was an Assistant Professor in the Department of Electrical Engineering and the Electrosience Laboratory at The Ohio State University in Columbus, Ohio.

Dr. Garber’s areas of specialization include decision theory, information theory, and pattern recognition with

applications to target recognition and identification. He is also involved with communication theory with emphasis on modulation techniques and system performance analysis for fading and interference channels. Dr. Garber has authored or co-authored 16 journal articles and 25 conference articles. He has served as advisor for four Ph.D. students and 15 M.S. students. He has also been the principal or co-principal investigator on 21 research contracts totaling over \$3,100,000.

Please join us as we welcome Dr. Fred Garber to the administrative ranks of the College of Engineering and Computer Science.

College of Engineering and Computer Science Annual Recognition and Awards Ceremony

Friday, June 9, 2000 at 4:30 P.M.

Student Union Multipurpose Room

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

Reception immediately following the ceremony.

Don’t forget to R.S.V.P. to:
775-5001 or E-mail dean-ecs@cs.wright.edu.

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Faculty on the Cutting Edge of Research and Education Frontiers

Recently, several faculty in the Department of Computer Science and Engineering have received some very prestigious grants. They received these grants because they are dedicated and highly qualified researchers and educators, but also because they are pioneers in their field who are exploring unique areas.

Recently, news headlines have exhibited the need for research and education in some of these new areas. That is certainly the case with Dr. Prabhaker Mateti's newest venture—new courses on designing firewalls and other Internet security measures. One week after Dr. Mateti's first course in internet security began, President Bill Clinton announced a \$2 billion plan to combat cyber terrorism.

The government's concern with cyber terrorism is quite justified. Computer networking has become ubiquitous.

Security breaches are becoming increasingly more common, more widespread, and more damaging. Hackers, Trojan

Horses, Viruses, and Worms are just a few of the hazards that have been the subject of recent news reports. In addition, the sanctity of personal data stored on computers such as medical or financial information is also of concern. These dangers affect both industry and private users and can have some very far-reaching consequences. However, most graduates of computer science or computer engineering programs, especially at the undergraduate level,

lack sufficient understanding of security issues and are not technically prepared to deal with them competently and quickly. Therefore, there is an urgent need to include courses like Dr. Mateti's "Linux Network Firewall" and "Internet Security" in the curriculum of computer science and engineering undergraduate students. Local industries are eager to see the results of Dr. Mateti's new courses and students with these courses on their transcripts will more than likely see plenty of job offers come their way.

Funding for the development of Dr. Mateti's new courses came from a grant from the National Science Foundation with matching funds from Wright State University. The majority of the funds were used to establish SecLab, a computer laboratory consisting of 15 PC-clones capable of running both Unix (Linux)

and Windows NT/2000.

These two operating systems were chosen largely because Unix systems

have long been the primary target for

attack for two crucial reasons: promoted remote access and open source code. Windows NT, however, is moving into the forefront as a primary target for attack because of its large installation base.

The overall goal of Dr. Mateti's courses is to present current security issues along with a skeleton of solutions and education of further resources to explore if needed. Specifically, Dr. Mateti plans to

spend the majority of course time teaching security improvement techniques and explaining the exploitable errors in software development. He also plans to raise the level of ethics awareness and explore some of the legal issues involved. These goals are accomplished by the development of approximately 15 laboratory experiments, which will be conducted on isolated LANs plus several team projects that will strengthen the basic and experimental understanding of firewalls.

One stipulation attached to the NSF grant funds states that the newly developed course information must be shared with other colleges. Dr. Mateti is accomplishing this goal by developing a web site that will contain:

- ◆ Detailed descriptions of the laboratory setup, term projects, and experiments;
- ◆ copies of lecture notes;
- ◆ An "instructor's manual;"
- ◆ Articles on legal and ethical issues;
- ◆ Source code of security software tools; and
- ◆ Peer reviewed links to other security-related web sites.

The web site URL is www.cs.wright.edu/~pmateti/Courses/InternetSecurity/. If you would like more information about the web site or these new courses, contact:

Dr. Prabhaker Mateti
Department of Computer Science
and Engineering
E-mail: Pmateti@cs.wright.edu
Voice Phone: (937) 775-5131



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Outstanding Student Awards Presented for the Year 2000

Erin Bartling – Biomedical Engineering. Erin's accomplishments at Wright State University include both Beuchler and Merit Scholarships. Her departmental honors thesis is entitled "Detection and Prevention of Falling in Persons with Progressive Supranuclear Palsy and in the Elderly." Erin transferred to WSU from Miami University where she had received the Joseph Culler Physics Award for outstanding achievement in physics for first and second year students. She was on the Dean's List at WSU and Miami, as well as the President's List at M.U.

Erin's activities include the Student Advisory Council for the Department of Biomedical, Industrial, and Human Factors Engineering, Tau Beta Pi, and the Golden Key National Honor Society. She has been a part of Habitat for Humanity at Wright State and Miami University, as well as being a Gift Teacher at St. Christopher Church. In her spare time, she plays soccer. Erin has accepted a graduate research fellowship at the University of Iowa in orthopedics biomechanics.

Jonathan Geist—Human Factors Engineering. Jonathan attended Wright State University on a Valedictorian Scholarship. He has also received the Robert C. Byrd honors scholarship, and scholarships from the Department of Biomedical, Industrial, and Human Factors Engineering and the Department of Mathematics and Statistics.

While at Wright State, Jonathan served as a student ambassador to Beijing Normal University, Beijing, China. He is also a member of the Golden Key National Honor Society, the Wright State Chapter of the Human Factors and Ergonomics Society, and the Society for Applied and Industrial Mathematics.

Jonathan is currently completing the Human Factors Undergraduate Honors Program. His honors thesis is entitled "The Use of Genetic Algorithms to Construct Human Operator Models." His senior design project was entitled "Pedestrian Knee Legform."

Jonathan will be graduating from Wright State in June 2000 with degrees in Human Factors Engineering and Applied Mathematics. During his time at Wright State, he has been a teaching assistant for both the College of Engineering and Computer Science and the College of Science and Mathematics. He has also served as a research assistant in the interactive systems modeling and simulation laboratory on two projects funded by the U.S. Air Force Research Laboratory. This work has resulted in three refereed technical articles. Jonathan has accepted a scholarship from Pepperdine University, Malibu, California, where he will study international law.

Emily Kempfer—Industrial and Systems Engineering. Emily entered Wright State University on a Valedictorian and Salutatorian Scholarship. Her accomplishments include: Dean's List with Honors, National Leadership Institute, Golden Key National Honor Society, Phi Kappa National Honor Society, Alpha Lambda Delta Co-ed Honors Fraternity, and Who's Who Among American Universities and College Award.

Emily has served as an Academic Advantage Student Leader, an Academic Advantage Math Tutor, Vice President of the Society of Women Engineers, and a Student Mentor. She was also a member of the Wright State University Women's Rugby Club and served as secretary. Emily's activities also include

volunteering with her church youth organization and participating in a home repair project with a sister church in Monticello, Kentucky.

David Kelley – Computer Engineering. David Kelley graduated from Beaver Creek High School in 1994 where he was recognized as a National Achievement Test Semi-Finalist, with a GPA of 3.96. He matriculated to Centre College in Danbury, Kentucky, where he graduated cum laude with a Bachelor of Arts degree in Music in 1998.

He entered Wright State University Fall, 1998 to pursue a second bachelor's degree in computer engineering. He has completed 88 hours in that program while maintaining a perfect GPA of 4.00.

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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 World Wide Web at <http://www.cs.wright.edu/bitsandpcs/default.html>. Copies are also available in the College office, any Department office, literature racks 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 September 4, 2000. To submit items for this issue, call the College of Engineering and Computer Science at (937) 775-5001, or send E-Mail to kthis@cs.wright.edu by August 18, 2000.

Outstanding Student Awards for Year 2000 — Continued

According to one of David's previous professors, he is a great student to have in class, picking up new material effortlessly. Another of his professors wrote, "I had David in two of my courses this year. In both courses he was the top undergraduate student. David has the marked distinction to be one of the few students who has ever achieved a perfect score on one of my final exams."

David is certainly a well deserving recipient of this award.

Corey Westrick — Computer Science. Corey Westrick is one of our very best students not just because of his near perfect GPA, but because of the quality of his work. He developed a new distribution of Linux that can be booted and run entirely from a CD without installing a single file on the hard disk of a PC. This brings Linux at home to many a reluctant student.

In addition, Corey was part of a team that did a security audit of WSU's computer network. He showed remarkable ability to learn new techniques and became an excellent systems person in a short time. Corey was an intern at IBM and has parlayed that internship into an excellent job offer from IBM.

Our congratulations on being selected the Outstanding Senior of the Year.

Ariana Kalter — Electrical Engineering. Ariana is a very bright student. Her professors were impressed with her ability to grasp difficult material quickly and her desire to understand the fundamental reasoning behind the subject matters. One professor stated that Ariana "has an exceptional mind and I can easily say that she is the best student I have ever had in my 20 plus years of teaching."

In 1998-99, Ariana was a teaching assistant for the newly-designed class for incoming engineering students. Ariana did an outstanding job. She was a teacher, a mentor, and a friend to the students. She helped the students get over the freshman jitters and helped them to grow. Students held her in high esteem.

Ariana has been very generous with her time. She has served as Vice President of the WSU chapter of Tau Beta Pi national honor society. She is very organized and takes great pride in all of her community service activities. She attended the Tau Beta Pi national convention and helped in installing a chapter at Cedarville College.

Ariana is a great natural leader and one of Wright State's brightest and best. After graduation, Ariana will be attending Purdue University to pursue a Ph.D. in Electrical Engineering.

Richard Thompson—Engineering Physics. Richard came to Wright State University as a freshman from Stebbins High School with over 40 college credit hours of work acquired through Wright State University or granted by examination. Not being content to just be an honors student majoring in Computer Science, Richard added Engineering Physics as a second major during his sophomore year. Then, he added an honors component to his Engineering Physics curriculum during his junior year.

In addition to maintaining an admirable academic record, Richard has also been employed during most of his undergraduate career. He works for the Electron Devices Branch of the Air Force Research Laboratories working on reliability issues with GaAs devices. For his senior design project, Richard designed and implemented a

protocol for the manufacture of heterojunction bipolar transistor arrays so as to provide for uniform thermal characteristics in the devices—a project that would challenge many masters students.

In recognition of his academic excellence, Richard has been nominated to the Tau Beta Pi honor society of engineering students and to the Sigma Pi Sigma honor society for physics students. Richard has been accepted with full support for graduate study in Electrical Engineering at Cornell University, where he will continue to study device fabrication and where he will have access to one of the world's most sophisticated fabrication facilities.

Dora McCarty—Materials Science and Engineering. Dora graduated from Greenon High School in Springfield, Ohio, with a 3.97 grade point average. Dora received a nomination to the Air Force Academy, but chose to attend Wright State University instead. Dora is a member of the Tau Beta Pi Honor Society, the French Honor Society, the Alpha Sigma Mu Materials Honor Society, and the National Honor Society.

In addition to Dora's academic achievements, she has performed research activities with material science faculty and worked with ceramic matrix composites as a co-op student at the Air Force Research Laboratory. Dora's campus and community activities include serving as President for the Wright State Student Chapter of ASM/TMS, treasurer of the Alpha Sigma Mu Materials Honors Society, a Mercy Medical Center volunteer, a member of the Baptist student union, and a Tae Kwon Do and cardio-kickboxing instructor.

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CS 399—Web Design

Registration Details: (Note: departmental permission required—go to the department office, 303 RC, or call 775-5131 for more information):

Section: C01 (Summer session C – 10 weeks)

Time: Tuesday & Thursday 4:10-5:25 PM

Credits: 4

Call Number: 74811

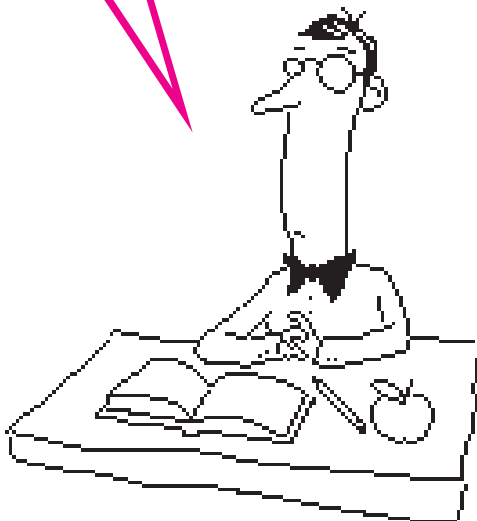
Prerequisites: some knowledge of a higher-level language (C/C++, Java or Visual Basic, etc.), knowledge of object-oriented programming a plus.

Internet and World Wide Web (Programming): This course assumes some knowledge of C++, Java or Visual Basic. We are going to cover many topics and use many industrial strength tools (sometimes “bleeding edge” technology). This will be very hands-on, fast paced, experimental class. The final project will involve distributed technologies. The general topics will include: HTML 4, Web Graphics, Microsoft FrontPage Express, Microsoft Visual InterDev 6, JavaScript, Dynamic HTML, Electronic Commerce and Security, Web Servers (PWS, IIS), Database: SQL, ADO and RDS, Active Server Pages (ASP)

Text book: *Complete Internet and World Wide Web How to Program Training Course*, Student Edition, 1/e, © 2000 / ISBN: 0-13-085609-6, **Harvey M. Deitel, Paul J. Deitel, T. R. Nieto**

Ty D. Upp says

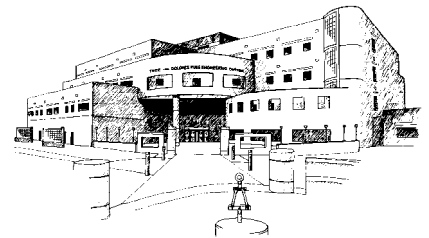
Check your
mail...
All of it!



Many of you have more than one e-mail account. Please be sure to check your Wright State e-mail account often for information about activities, new courses, schedule changes, and other College of Engineering and Computer Science events that may be of interest to you.

In the event you need to be removed from a particular CECS list serve, contact the College Central Computer Staff—Sheila Hollenbaugh (X5077), Doug Supp (X5078), or Mike Van Horn (X5157)—rather than the sender of the message.

*Thanks for your
attention to this
matter!*



Fritz and Dolores Russ

BITs & PCs

College of Engineering and
Computer Science

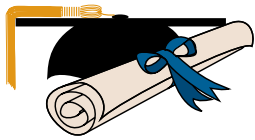
Dean

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

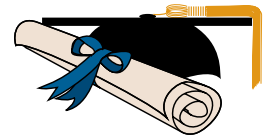
Editor and Staff Writer

Karil S. This

Submit questions, articles and ideas to
Editor, 405 Russ Engineering Center.
The College of Engineering and
Computer Science reserves the right to



Congratulations June 2000 Graduates



BACHELOR'S DEGREES

Mohammad Ali Almubaslat BSBE
 Erin A. Bartling BSBE
 Bradley M. Bergman BSME
 Mercedes R. Blue BSBE
 James R. Boza BSCS
 Christopher A. Browning BSEE
 Shiang-Pu Cheng BSCS
 Matthew A. Clark BSEE
 Mitchell A. Cooke BSME
 Richard D. Craft BSEE
 Tracey L. Culbertson BSCE
 Christine E. DeJean BSEE
 Larry M. Dickey BSEE
 David W. Dorton BSME
 Susan J. Ellison BSHF
 Thomas I. Farrell BSME
 Jonathan A. Geist BSHF
 Rodney M. George BSEE
 Jared L. Glaspell BSHF
 Robert C. Goffena BSCS
 Tanika M. Graham BSME
 Christine M. Groh BSHF
 Elizabeth A. Hanning BSEE
 Richard J. Harold BSME
 Bret E. Hartzell BSBE
 Erich J. Heidenreich BSCS
 Keith E. Henseler BSEP
 George M. Hill BSME
 Andrew L. Hoffmaster BSCS
 Aaron D. Hohenbrink BSCE
 Jason L. Hollinger BSME
 Robert D. Hoskins BSBE
 Donald W. Imboden BSME
 Michael A. Ingram BSBE
 Ariana C. Kalter BSEE
 Adam K. Kayser BSCS
 Kelly A. Kidd BSHF
 Joslin T. Kies BSHF
 Ralph H. Koussa BSME
 Jonathan P. Kuhns BSME
 Raymond C. Lacson BSBE
 Kevin M. Lawrence BSEE
 Anthony J. Levay BSEE
 Eric E. Lowe BSCE
 Philip J. Marascalco BSBE
 Adam C. Marcotte BSEE
 Tamela L. Martin BSHF
 Freddy J. McDougle BSBE
 Krista L. McKinney BSME
 Brooke H. McNally BSBE

Stephen K. McPherson
 Andrea B. Monhollen
 Alamgir A. Muhammad
 Philip D. Myers
 George Nemore, Jr.
 Nam D. Nguyen
 Donald E. Peters
 Eric S. Pooler
 Ayman A. Rabi
 Shalini Reddy
 Charles O. Roberts
 Roger C. Rucker
 Rachel J. Salacinski
 Douglas R. Sattler, Jr.
 Christopher R. Savage
 Gary L. Schmaltz
 Megan E. Seipel
 Rahul K. Shah
 Paul F. Sisk
 Aaron W. Smith
 Usman Sohail
 Mark P. Squire
 Heather A. Steigerwald
 Anthony W. Taphorn
 Richard M. Thomson
 Richard M. Thomson
 Jenner M. Torrence
 Karen M. Wappelhorst
 Stanley P. Waskiewicz IV
 Corey D. Westrick
 Anthony D. White
 Andrea L. Williams
 Bethany R. Wilson
 Bradley J. Wolters
 Jayson D. Zadzilka

MASTER'S DEGREE

Anup K. Aggarwal
 Dhivakar P. Baskaran
 Richard V. Burns
 James W. Clingersmith
 John A. Collier
 Sarat V. Dasaka
 Jeffrey A. Demchak
 Andrew E. DeRosa
 Sameer D. Desai
 Sumedha M. Dharmadhikari
 Nathaniel E. Donat
 Mang Fang
 Matthew D. Garay
 Venkata R. Godavarthy

BSME
 BSCS
 BSCE
 BSEE
 BSMA
 BSME
 BSEE
 BSEP
 BSCS
 BSCS
 BSME
 BSCS
 BSEE
 BSEE
 BSBE
 BSCS
 BSHF
 BSME
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 BSBE
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 BSEP
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 BSBE

MSCE
 MSCE
 MSEE
 MSEE
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 MSEE
 MSBE
 MSBE
 MSCE
 MSEE
 MSCS
 MSCS
 MSHF
 MSME

Jing Gong
 David C. Hanna
 Vikram P. Hardi
 David M. Hoeflerlin
 Sunita Iruku
 Stephanie L. Ives
 Ramesh V. Iyer
 Gopalkrishnan K. Iyer
 Bryan S. Jones
 Bhavin M. Juthani
 Rajgopal P. Kantamneni
 Robert B. Keefer, Jr.
 Ramzi M. Khaouli
 Prahlad S. Kondapally
 Oihua Li
 Bivan Li
 Ronald L. McDonald, Jr.
 Sean E. McNew
 Rajeev Ohri
 Debashis Panda
 Huilian Pang
 Ankit T. Parikh
 Satish E. Paul
 Teresa Perkins
 Venkata R. Pothamsetty
 Talati M. Pradip
 Michael A. Pratt, Sr.
 William C. Quinn
 Mohammed F. Qureshi
 Titash Rakshit
 Gamini T. Ranathunga
 Andrew J. Roby
 Heath S. Ruff
 Sandeep Sankarlal
 Michael J. Shepard
 Kevin M. Sherd
 Amandeep Singh
 Andrew C. Snyder
 Pradeep H. Sukhani
 Deepa Vallabhaneni
 Neeraja Vanam
 Kiran K. Velicheti
 Sriram Vemuri
 Zhongsheng Wang
 Ammon K. Wright
 Andrew R. Wright
 Li Zeng

DOCTORAL DEGREES

Brian Joyce Egr. Ph.D
 Kristen K. Liggett Egr. Ph.D

Please Note: This list is not binding. All names listed above are subject to degree certification before graduation is considered final.

Faculty on Cutting Edge of Research and Education–Continued

Another pioneer on the research front is Dr. Francis Quek who, along with an impressive conglomeration of researchers from several other disciplines and institutions, has received approximately \$1,200,000 in instrument capitalization from various sources to establish VISlab—a vision interface and systems laboratory. The purpose of VISlab is to provide an environment for interdisciplinary research into gesture, speech, and gaze with the anticipated result of a better understanding of human psychology and communication.

The National Science Foundation, Silicon Graphics Inc., Ohio Board of Regents Action Fund, Wright State University, and ITRI have provided funding and in-kind services for this initiative. A Center for Computational Comprehensive Computation is being established at Wright State University, which will employ two research assistant professors and eight graduate research assistants. The focus of the technological center is a 12 gigabyte

RAM/360 gigabyte fiber channel hard drive which will allow access to 1 megabyte per second video processing of extensive video databases of video analysis of human hand gestures and gaze in correlation with speech.

This computer will vastly enhance the classification, sorting, and cross-referencing of the extensive video databases. Thus, facilitating the interdisciplinary nature of the Gesture, Speech, and Gaze (GSG) research project. GSG has three main disciplinary forks—natural language processing/speech recognition, psycholinguistics/linguistics, and neuropathology.

Under the psycholinguistics/linguistics fork, Francis Quek of Wright State University, John Haviland of Reed College, and David McNeill of the University of Cincinnati will be focusing on cross-cultural anthropological linguistic comparison of spatial construction. Francis Quek and David McNeill, along with Rashid Ansari of UIC,

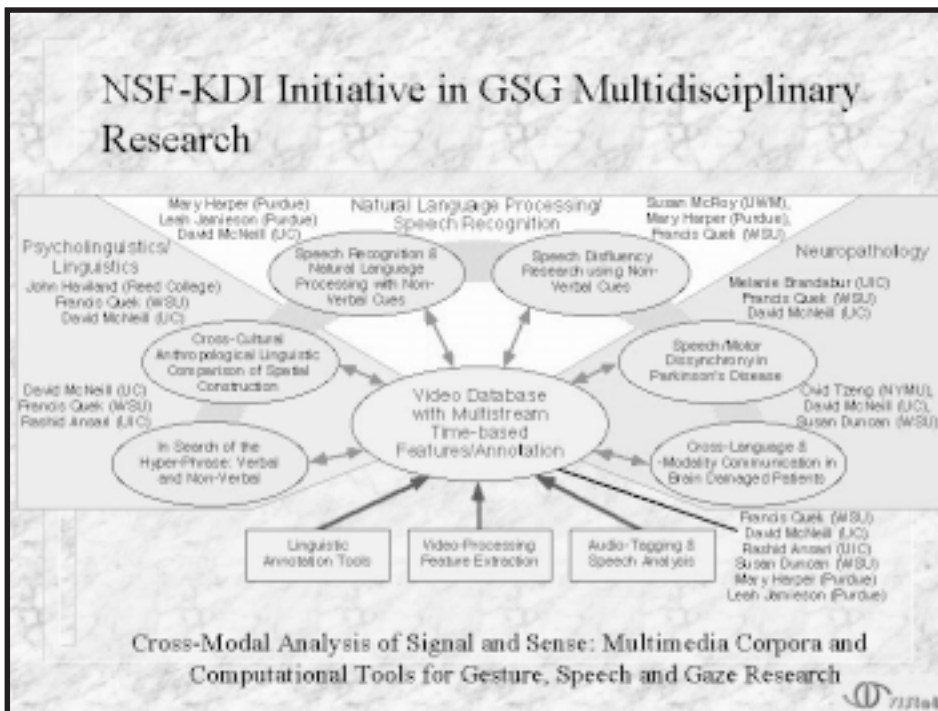
will also conduct research in search of the hyper-phrase, both verbal and non-verbal.

Under the natural language processing/speech recognition fork, Mary Harper of Purdue University (currently a visiting professor at WSU), Leah Jamieson of Purdue University, and David McNeill, will concentrate on the areas of speech recognition and natural language processing with nonverbal cues. While Susan McRoy of the University of Western Michigan, along with Francis Quek and Mary Harper, will concentrate on speech disfluency research using nonverbal cues.

Finally, under the neuropathology fork, Melanie Brandabur of UIC, along with Francis Quek and David McNeill, will conduct research into the speech/motor dissynchrony in Parkinson's disease. While Ovid Teng of New York Medical University, Susan Duncan of Wright State University, and David McNeill will investigate cross-language and cross-modality communications in brain damaged patients.

Each sector of the GSG research project hopes to apply the results of the research in unique ways to their own discipline. In addition, the research should provide exciting new insight into human communication and provide a prism through which human thought can be studied. Anyone interested in further information regarding the GSG research should contact:

Dr. Francis Quek
Department of Computer Science
and Engineering
E-mail: quek@cs.wright.edu
Voice Phone: (937) 775-5131



Multidisciplinary interaction and cooperation is a key factor in achieving success in GSG research.



Faculty on Cutting Edge of Research and Education—Continued

Dr. Ricardo Gutierrez-Osuna, Department of Computer Science and Engineering, is also exploring relatively uncharted regions on the research frontier. Dr. Gutierrez-Osuna has received a four-year, \$300,000 grant from The National Science Foundation's (NSF) Faculty Early Career Development Program (CAREER) for his research proposal on sensor-based machine olfaction (SBMO). The NSF CAREER program recognizes and supports the early career development activities of junior faculty who are most likely to become the academic leaders of the 21st century. CAREER awardees are selected based on creative, integrative, and effective research and education career development plans that build a firm foundation for a lifetime of integrated contributions to research and education.

The NSF CAREER grant is one of the most prestigious awards available to new faculty and this the first time a faculty member in the WSU College of Engineering and Computer Science has merited such a distinction. The CAREER program is highly competitive because it is available to all science and mathematics disciplines and the stringent review process, which consists of 4 external reviews and 2 panel reviews. On average, only roughly between 10-20% of the proposals submitted each year merit funding.

This premier CAREER program emphasizes the importance the National Science Foundation places on the early development of academic careers dedicated to stimulating the discovery process in which the excitement of research is enhanced by inspired teaching and enthusiastic learning. Dr. Gutierrez-Osuna's work in sensor-based machine olfaction (SBMO)—essentially, an electronic nose—is an extensive, multi-disciplinary project

that is very new and only a few other institutions are venturing into this research sector. However, there is much potential benefit to be gained from delving into this difficult and challenging sector.

Recent advances in sensor-based machine olfaction (SBMO) have opened the possibility for revolutionary computer interfaces through the sense of smell. The multivariate response of an array of cross-selective gas sensors can be utilized as a feature vector to characterize odors by pattern recognition means. Current SBMO systems can be described as multivariate chemical sensing devices capable of identifying a fixed number of odors. While many practical odor analysis problems may be cast under this one-of-N pattern recognition framework, such formulation will prove overly restrictive for the more challenging odor analysis demands of the future. Analogously to the speech recognition and image understanding domains, for which specific frameworks have been developed, SBMO requires a unique body of theory and technological practices.

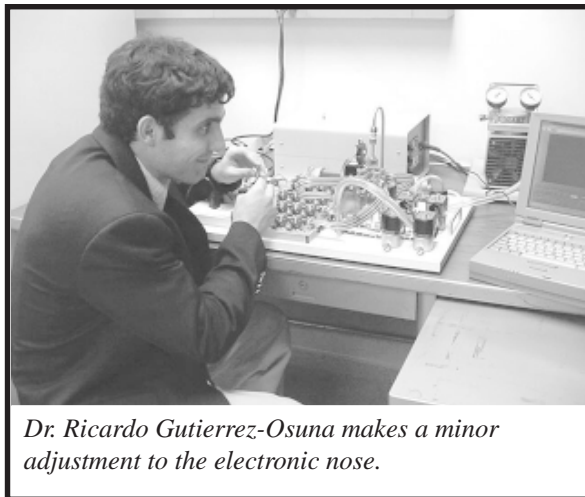
In order to meet the requirements of the CAREER program, Dr. Gutierrez-Osuna had to formulate a research plan in conjunction with an education plan. The Research Plan focuses on the development of a biologically plausible framework for SBMO, with an emphasis on computation, analysis and instru-

mentation. The specific objectives of this Research Plan are to:

1. develop a computational architecture based on neuro-morphic models of the biological olfactory system in order to improve the signal-processing and cognitive capabilities of SBMO,
2. validate perceptual plausibility of the computational architecture through comparative studies with the "gold standard" for olfactory perception: human panel sensory analysis, and
3. develop advanced sensor interrogation techniques in order to improve selectivity, sensitivity, and robustness of commercial conductivity-based gas sensor arrays.

The Educational Plan emphasizes the essence of engineering as an integrative process, especially the need for integrative research and design experiences in undergraduate engineering education. The specific objectives are:

1. create a series of multi-disciplinary and integrative capstone design modules for undergraduate students in the areas of Intelligent Sensors and Pattern Recognition,
2. develop an undergraduate course on Intelligent Sensors that



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Faculty on Cutting Edge of Research and Education—Continued

will integrate the areas of data analysis, embedded systems and sensor interfacing, and

3. develop a graduate course on Advanced Pattern Recognition paradigms, including connectionist, fuzzy, genetic, information-theoretic and biomimetic formulations.

This research project will establish the foundations for a new generation of SBMO systems by helping bridge the gap between multivariate chemical sensing (the present) and human olfactory perception (the goal). Improved analytical capabilities, as a result of advances in both signal processing and sensor instrumentation, will broaden the range of applications for SBMO. The most common use for SBMO, or an electronic nose, will most likely be in the food and drug industry to provide inexpensive and more

consistent methods of quality control through chemical analysis. Further research in SMBO could eventually reveal potential applications in areas of emissions, drug and/or explosives detection, among other things.

The proposed educational activities will increase research and design opportunities for undergraduate students, as well as improve both undergraduate and graduate curricula in the areas of intelligent sensors and pattern recognition. Furthermore, and perhaps more importantly, students will benefit from a rich and cross-disciplinary interaction with academic, industrial and government institutions. Some of the collaborators on this project include Professor Susan Schiffman from Duke University Medical Center, H. Troy Nagle from North Carolina State University, UES, Inc., and the Miami Valley Regional Crime Labs.

In order to carry out the objectives of this program, Dr. Gutierrez-Osuna will be looking for a few individuals to fill graduate research assistantships for the next four years. He will need graduate students, preferably at the doctoral level, with an interest in conducting sensory analysis and assisting in the design and analysis of biological models of the olfactory system. Backgrounds in computer science, computer engineering, embedded systems, electrical engineering, artificial intelligence, neuroscience, biology, or chemistry are highly desirable. Anyone interested in joining this multi-disciplinary research team should contact:

Dr. Ricardo Gutierrez-Osuna
Department of Computer Science
and Engineering
E-mail: rgutier@cs.wright.edu
Department Phone: (937) 775-5131
Office Phone: (937) 775-5120

New Course

ISE 301—STATISTICS FOR DEVELOPMENT AND MANUFACTURING I

MONDAY/WEDNESDAY FROM 2:00 – 3:50 P.M.

FALL QUARTER 2000

CALL NUMBER: 13496

- ISE 301 is designed specifically for engineering students with an emphasis on statistical methods and their applications for solving real-world engineering problems.
- The Departments of Electrical Engineering and Mechanical Engineering have approved this course as an accepted substitute for STT 363.
- This course is required for all BM, ISE, and HFE majors.
- ISE 301 will be offered Fall, Winter, and Spring Quarters.

FACULTY FACTS

Maher Amer, Ph.D., ME, received funding in the amount of \$29,999 from Mound Laser and Photonics Center, Inc., for his proposal entitled “Advanced Adaptive Optical Coating Process Technology.”

Dr. Amer also attended the “Best Assessment Processes Symposium” regarding student assessment methods and all other issues related to ABET 2000 accreditation criterion at the Rose-Hulman Institute of Technology in Terre Haute, Indiana, April, 2000. ❖

C. L. Philip Chen, Ph.D., CSE, published a paper entitled “The Equivalence Between Fuzzy Logic Systems and Feedforward Neural Networks” in the *IEEE Transactions on Neural Networks*, Vol. 11, No. 2, March, 2000, pp. 356-365 and a paper entitled “Interpolation Mechanism of Fuzzy Control and its Relationship to PID Control” in the *International Journal of Fuzzy Systems*, Vol. 2, No. 2, March 2000, pp. 23-30. ❖

Oscar Garcia, Ph.D.; A. Ardeshir Goshtasby, Ph.D.; and Ricardo Gutierrez-Osuna, Ph.D., all from CSE, have received funding in the amount of \$15,000 from the National Science Foundation for their proposal entitled “Speech-Driven Facial Animation.” ❖

Ardeshir Goshtasby, Ph.D., CSE, received \$30,000 of additional funding from Kettering Medical Center for his “Nonlinear Brain Image Registration” proposal.” ❖

Thomas Hangartner, M.D. & Ph.D., BIE, received funding in the amount of \$103,358 from Proctor & Gamble Company for his proposal entitled “Evaluation of a Novel Treatment for Osteoarthritis of the Knee.” ❖

Jack Jean, Ph.D., CSE and Karen Tomko, Ph.D., CSE, have received

funding in the amount of \$139,922 from the Dayton Area Graduate Studies Institute for their proposal entitled “Application Accelerating Reconfigurable Computer.” ❖

Nathan Klingbeil, Ph.D., ME, published two articles (with J.L. Beuth) entitled “On the Design of Debond-Resistant Bimaterials, Part I: Free-Edge Singularity Approach” and “On the Design of Debond-Resistant Bimaterials, Part II: A Comparison of Free-Edge and Interface Crack Approaches” in *Engineering Fracture Mechanics*, May, 2000, Vol. 66, pp. 93-110 and pp. 111-128. ❖

Richard Koubek, Ph.D., BIE, has received funding in the amount of \$179,629 from the U.S. Department of Transportation, Federal Aviation Administration for his proposal “Human Factors Engineering in Air Traffic Control.” ❖

Sharmila Mukhopadhyay, Ph.D., ME, (with (G.Y. McDaniel, S.T. Fenstermaker, D.E. Walker, W.V. Lampert, and P.H. Holloway) published an article entitled “Electron-stimulated oxidation of silicon carbide” in *SURFACE SCIENCE*, 445: (2-3), pp. 159-166, January 20, 2000. She was also invited to present on the topic of “Materials Science Education for the Information Age” at the Teaching Electronic, Magnetic and Optical Materials Symposium and on the topic of “Dopants in Processing of High Temperature Superconductors,” at the High Temperature Superconductors Symposium at the TMS Annual Meeting in Nashville, March 12-16, 2000. ❖

Francis Quek, Ph.D., CSE, has received funding in the amount of \$17,488 from Advanced Telecommunications Research Integration and Communications

Research Laboratories for his proposal entitled “Avatar-Based Interfaces for Virtual Communication Environments.” ❖

Joseph Slater, Ph.D., ME, (with Sean Mortara and Philip Beran, AFRL) presented a paper entitled “A Proper Orthogonal Decomposition Technique for the Computation of Nonlinear Panel Response” at the 41st AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference and Exhibit, April 3-6, in Atlanta, GA.

Dr. Slater also directed the following student presentations:

Tony Taphorn, Andrew Meyer, and Scott Schrinner (ME undergraduates): presented “FoRTeS II: Forced Response Test System II” at the Ohio Society of Professional Engineers Senior Project Showcase. The paper received 1st prize.

At the 25th Annual Dayton-Cincinnati Aerospace Science Symposium on March 30th:

Tony Taphorn, Andrew Meyer, and Scott Schrinner (ME undergraduates) presented “FoRTeS II: Forced Response Testing System II;”

Joseph Slater and Sandeep Sankarlal (ME Master’s Candidate) presented “Blade Frequency Calculation for Tuned Aeroelastic Analysis;”

Al Gopinathan (M.S. in ME), S. Mortara, and Joseph Slater presented “Limit Cycle Oscillation Model Identification Using the Minimum Model Error Method;” and

S. Mortara, Joseph Slater, and Philip Beran (AFRL), presented “A Solution To The Nonlinear Flutter Problem Using Proper Orthogonal Decomposition.” ❖

2000 Graduate Student Excellence Awards

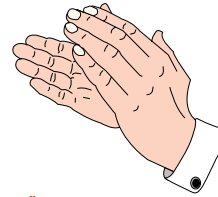
The School of Graduate Studies recognizes the achievements of the individuals listed below by honoring them with the 2000 Graduate Student Excellence Awards. These awards are granted based on nominations by faculty in the students' graduate program area. Criteria for the selection include superior academic achievement, noteworthy thesis work, and potential for significant contributions to their fields.

MASTER'S STUDENTS

Brad Bryant	Electrical Egr.
Timothy Leger	Mechanical Egr.
Dennis Murphy	Mat. Sci. and Egr.
Heath Ruff	Human Factors Egr.
Denise Worst	Computer Egr.
Hongmei Zhang	Computer Science

DOCTORAL STUDENTS

Marcel Jackowski	Comp. Sci. Ph.D.
Kristen Liggett	Engineering Ph.D.
Ravi Penmetsa	Engineering Ph.D.



Congratulations!

Outstanding Student Awards for Year 2000 — Continued

The Materials Science and Engineering program is proud to have Dora McCarty as their outstanding senior.

Matthew Dietz—Mechanical Engineering. Matt graduated from Botkins High School in Botkins, Ohio. He graduated from Wright State this past March with a B.S. in mechanical engineering and a 3.94 GPA. Matt is a member of the Tau Beta Pi National Honor Society, the Phi Kappa Phi National Honor Society, and the Golden Key National Honor Society.

In addition to Matt's academic achievements, he has also collected a great deal of work experience during his undergraduate experience. He has had co-op positions at a number of Dayton area companies and labs. Matt has assembled, disassembled, and tested prototype pumps, evaluated customer pump problems, and evaluated wear on pump impeller seal rings at the Flowserve Corporation. He has done research on titanium matrix composites which included preparing specimens and inspecting them with a scanning

electron microscope at Wright Patterson Research Laboratories. He has also built prototype brake hose assemblies and worked at doing pre-production runs of brake hose assemblies at Delphi Chassis Systems.

Presently Matt is working at Delphi Chassis in Vandalia as a manufacturing engineer. The Mechanical Engineering program is proud of the achievements of Matt Dietz and is sure that he will be a valuable asset to the Delphi Corporation.

Congratulations to these very deserving Outstanding Students!

EMPLOYMENT OPPORTUNITIES



Student Research Program

- Research opportunities at WPAFB Materials Lab
- Flexible work schedules—We will work with you!
- Career related work experience!
- Earn & learn (\$10.00 - \$15.30/hr)
- Undergraduate to graduate students
- Degree seeking students in good standing
- Must be a U.S. Citizen

POSITIONS AVAILABLE MAY AND JUNE 2000

Project #174B—Research in Nonlinear Optical Materials (Majors: physics and electrical engineering). Description: Characterization of materials using different techniques including interferometry, optical second harmonic generation, and absorption spectroscopy. Data to be obtained may include refractive indices, nonlinear coefficients, electro-optic, piezoelectric and thermo-optic coefficients. Modeling will include calculation of phase matching loci, acceptance angles, and conversation efficiency for various optical frequency conversion processes.

Project #179A—Evaluation of Oxide/Oxide CMC's for Aerospace Turbine Engine Combustors (Majors: mechanical engineering). Description: A detailed matrix of environmental exposure tests will be conducted. After exposure, test specimens will be tensile tested for residual tensile strength. Methods of characterization will include scanning electron microscopy (SEM), quantitative microscopy (QM), optical microscopy, and thermogravimetric analysis (TGA). Presentation and technical reports will be required for briefing progress on the research program.

Project #183A—Microstructural Characterization (Majors: mechanical engineering and materials science). Description: Major duties consist of metallography and fractography support including cutting, grinding, polishing, etching, and photographing metallic materials and failed test specimens using metallographic equipment and both optical and scanning electron microscopes. Other duties consist of data reduction and analysis of mechanical property data using programs such as Excel and Grapher for Windows. Some time may be spent in testing of metallic materials including tensile and micro hardness measurements.

Project #196A—Infrared Laboratory Experimental Automation (Majors: electrical engineering, physics). Description: Develop and document laboratory automation based on LabView software. The instruments to be automated include precision motion controllers, energy meters, a custom optical attenuator, shutters, and lasers. Functions must be controlled from a single software package and coordinated to yield high quality experimental data. The student should possess a thorough understanding of laboratory automation techniques and in-depth understanding of microcomputer hardware and software.

Project #201A—Degradation Studies of Conductive Elastomers (Majors: materials science physics). Description: Hands-on, in-house research and development in electrically conductive elastomer materials performance degradation phenomenon and new materials development. The work may include thermal analysis (DTA, DSC, DMA), chemical analysis (FTIR, Raman), surface chemical analysis (XPS), analysis of the effects of various environmental exposure effects

(humidity, aircraft fluids), curing studies, development of novel methodologies for conductivity testing and a variety of mechanical properties studies directed to elucidate performance and failure mechanisms.

Project #222A—Tribology and Deposition of Cs Based Solid Lubricants (Majors: materials science, chemical engineering, chemistry). Description: Study the energy and angular distribution of atoms and molecules in the plume/plasma generated during pulsed laser deposition (PLD). Study the synthesis, structure, and property relations in Cs-based lubricants. Analysis techniques such as X-ray diffraction, X-ray photoelectron spectroscopy, pin-on-disk tribometer, scratch tests, and nano hardness tests will be used to characterize the films.

Project #223A—Electrical and Optical Properties of Polymers (Majors: physics, electrical engineering, materials science). Description: Determine the parameters for improving the electrical conductivity, dielectric constant, and linear and nonlinear optical properties of polymers. The student will perform experiments and analyze data to meet this objective. Experiments include DC and AC electrical conductivity, photoconductivity, photovoltaic response, dielectric constant, photo-and-electro-luminescence, waveguiding, and electro-optic coefficient.

For more information about these positions, call (937) 910-5808 or visit www.soche.org. To apply for a position, submit a SOCHE application, resume, and transcript to:

SOCHE
3155 Research Blvd., Suite 204
Dayton, OH 45420-4015
FAX: (937) 910-5801

INSPEC Finds More Engineering Literature

Having trouble finding journal articles, conference papers, or proceedings?

The University Libraries and OhioLINK introduce another research tool for engineers: INSPEC. INSPEC provides comprehensive indexing and abstracting of literature in electrical engineering and electronics, computer science, control engineering, physics, and information technology. Significant coverage is also provided for materials science, biomedical engineering, and nuclear engineering.

The database is worldwide in scope, covering more than 4,000 scientific

and technical journals, 2,000 conference proceedings, and numerous relevant books, reports, and dissertations published from 1969 to the present. INSPEC contains references, summaries, and links to available full-text articles.

INSPEC can be used on any campus computer in the wright.edu domain. External access is provided through OhioLINK's authentication of your library account.

For more information or other engineering library needs, contact:

Phil Flynn
Engineering Librarian
Telephone: 775-2533
E-mail: phil.flynn@wright.edu

2000-01 Fulbright International Study Program

The Fulbright U.S. Student program is accepting applications for the 2001-2002 academic year from undergraduates, graduates, and young professionals to obtain international experience for personal development. Projects under the Fulbright program may include university course work, independent library research, field research, or other related projects.

The program includes submission of an application through the Fulbright campus advisor. The application must be received by the U.S. Fulbright Commission to its New York office of the Institute for International Education by October 25, 2000.

Funding for the program includes travel, stipend, and housing which provides for almost all of the Fulbright fellow's expenses. Students applying for fellowship in a non-English speaking country must demonstrate their proficiency in the foreign language.

A web site is available for additional information at <http://www.ie.org/fulbright>. For further information and an application, contact Robert Scherer, Associate Dean, College of Business and Administration and campus Fulbright representative, at (937) 775-3718 or email him at: robert.scherer@wright.edu.

These positions require US citizenship and ability to get a security clearance. If you're interested, please forward a resume via email to:

Mr. Loc Pham
loc.pham@edwards.af.mil

Mr. Pham will review your resume and provide it to all branch chiefs in the Avionics Systems Integration Division for consideration.

California Urgently Needs Engineers

Avionics Systems Integration Division (412 TW/TSV) at the Air Force Flight Test Center (AFFTC) has an urgent need for 43 engineers (aerospace, mechanical, electrical, and industrial) at all levels, from recent graduates to experienced engineers. Edwards AFB is located just North of Los Angeles County, California. The surrounding community is Lancaster/Palmdale with a population of about 250,000 and located about 80 miles North of Los Angeles.

These engineering positions will participate in planning, executing, and reporting of flight test for various systems on many different types of aircraft including B-1, B-2, B-52, F-15, F-16, F-22, C-17, etc. Edwards engineering community has recently changed to a contribution compensation-based appraisal system (CCAS) which allows us to offer very competitive starting salary commensurate with experience.

If you love airplanes and the challenge of flight test, come to

Edwards and participate in flight testing and hands on experience with some of the most advanced and sophisticated aircraft in the USAF inventory including those under development such as the F-22 and Joint Strike Fighter (JSF). Testing of Airborne Laser and Unmanned Air Vehicle (UAV) will also be conducted at Edwards. Flight test at Edwards encompasses several disciplines such as flight control, flying qualities, terrain following, envelope expansion, weapons integration, operational flight software upgrade, radar systems, embedded GPS navigation system, radio communication, etc.

Each year, Edwards also provides several opportunities for engineers to further their graduate education full time in various disciplines (EE, AE, ME, etc) at many reputable universities, from 12 to 18 months. While going to school, in addition to full salary, full tuition and partial per diem will also be paid. ↪

Important Dates To Remember . . .

- June 5-10 — Spring Quarter Final Exams Week
- June 9 — CECS Awards Ceremony, 4:30 p.m., Student Union Multipurpose Room
- June 10 — Spring Commencement Ceremony
- June 12 — Summer Quarter terms A and C begin, late registration begins for terms A & C
- Late registration fee begins for Summer Quarter terms A & C
- June 13 — Last day to register, add classes, or receive 100% refund of fees for Summer Quarter A term
- June 14 — 70% refund of fees for Summer Quarter A term begins
- Grades for Spring Quarter due in Registrar's Office by Noon
- June 16 — Last day to register, add classes, or receive 100% refund of fees for Summer Quarter C term
- Last day to receive 70% refund of fees for Summer Quarter A term
- June 19 — 70% refund of fees for Summer Quarter C term begins
- June 20 — Last day to drop Summer Quarter A term classes without a grade
- June 27 — Last day to receive 70% refund of fees for Summer Quarter C term
- July 4 — Independence Day holiday, University Closed



WRIGHT STATE
UNIVERSITY

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Office of the Dean