



The OWL

A PUBLICATION OF THE SCHOOL OF ENGINEERING

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Letter from the Dean January 2010

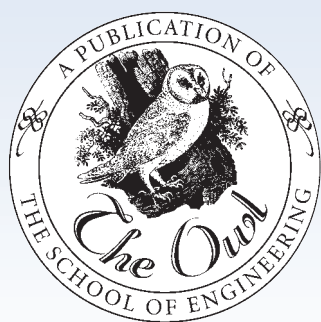


At the May 2009 Commencement ceremonies, and for the second time in the last three years, an engineering major, Noah Benjamin, was awarded the Bellarmine Medal for the highest academic record compiled during the four years of undergraduate studies. Noah had a straight 4.0 GPA. Two years ago it was Anthony Kunz, a student in mechanical engineering, who won the Bellarmine Medal. We are understandably savoring the success of these two SOE graduates, and of all our other students who excel in academic work, in industrial internships, senior design projects, and in the workplace after graduation. At 134 credit hours, the undergraduate engineering curriculum is not an easy one to navigate. Similarly, the curricula of the SOE master's programs, with a year-long capstone class as a graduation requirement, can be quite challenging. It takes perseverance on the part of the students, and a desire to succeed academically based on their vision of their future life as creators of original technology that will advance the human cause.

We are fully aware that the six billion individuals on Earth, separated by ethnicity, language, faith, culture, and national

self-interest, constitute a very complex social system. While 20th-century technology in communications and transportation could bridge the physical separation among peoples and establish multiple lines of interaction, the current consensus is that in the 21st century, technology divorced from social engagement, will not solve the world's problems. Hence, the responsibility of engineering educators is being reconfigured, from just imparting to their students technical skills and engineering knowledge, to adding a foundation of social responsibility, environmental sensibility, and economic values that spans national borders. This is a duty that all practicing engineers in the academy and industry who serve as teachers and mentors to the younger generation must undertake without reservations. It is my hope that their Fairfield education has empowered our own engineering alumni to heed this call.

Given limited earthly resources, it is proper to ask what are the main challenges that 21st-century engineering must tackle in the interest of humanity. The National Academy of Engineering has recently identified 14 such challenges awaiting solutions in this century, with clean water for all and the mapping of the human brain prominent among them. The 2009 issue of *Engineering in the National Academies* lists research reports and symposia proceedings



Fairfield
UNIVERSITY

School of Engineering

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Tau Beta Phi news

Ten members of Tau Beta Phi, the engineering honor society, were among the 39 SOE graduates at Fairfield's May Commencement. All but one majored in mechanical engineering.

A.J. Bellucci of West Haven, Conn., interned at Sikorsky Aircraft and intends to pursue an advanced degree in business. Noah Benjamin of West Simsbury, Conn., who won the Bellarmine Medal (see page 3), also interned at Sikorsky and played cello with the Fairfield University Orchestra.

Dan Ferrara, a computer engineering major from Shoreman, N.Y., interned at BAE Systems and plans to work there as a software engineer before pursuing an advanced degree in nanoscale engineering at SUNY Albany. Bill Kuroski of Bethel, Conn., works full-time as a senior engineer, mechanical design, for Perkin Elmer and transferred part-time to Fairfield from Naugatuck Valley Community College in 1999.

Lauren Loomer, of San Diego, Calif., earned a double major in mathematics and mechanical engineering and interned at Sikorsky for three years. In addition to Tau Beta Phi, she was inducted into the Pi Mu Epsilon, Alpha Sigma Nu, and Phi Beta Kappa honor societies.

Cristin Lucena of Orangeburg, N.Y., played for the women's varsity lacrosse team at Fairfield and interned at Jaros, Baum & Bolles. Nicholas Palumbo, of Mineola, N.Y., interned at Emhart Teknologies and Ashcroft. He intends to go for a master's degree.

Chris Rappoli, of Wakefield, Mass., interned at Sikorsky and plans to continue graduate studies in mechanical engineering at Columbia University. Jason Viadero, of Montague, Mass., interned at Spine Wave and plans to pursue a master's degree.

Sean Zandan, of Stratford, Conn., plans to pursue both a graduate degree and a career in the aerospace or energy industries.

Three seniors are the 2009-10 officers for Tau Beta Phi. Craig Alonzo, of Danbury, Conn., is an electrical engineering major who works full-time as an electrical engineering supervisor at Pitney Bowes. He transferred to Fairfield part-time in 2004 from Western Connecticut State University. Christina Klecker, a mechanical engineering major from New Fairfield, Conn., interns at Playtex Products and Tek-Air Systems, Inc. Mallory Krupa, a mechanical engineering major from Seymour, Conn., interns at Farrell Corporation in the summers and was captain of the Seymour High School girls' basketball team.

Commencement



Noah Benjamin: Perfect record

SOE graduate Noah John Benjamin, of West Simsbury, Conn., was awarded the prestigious Bellarmine Medal, presented to the senior with the highest quality grade point average. Benjamin, who had a perfect 4.0 average throughout his undergraduate studies, is the second SOE graduate in three years to win the honor, following Anthony Kunz in 2007.

University President Jeffrey P. von Arx, S.J., presented the award to Benjamin at the University's 59th commencement in May. A mechanical engineering major, he will soon start a position with Sikorsky Aircraft Corporation in Stratford, where he interned his senior year. He'll work on a project concerning Sikorsky's S-76D helicopter, which successfully completed its first test flight in February.

Dr. E. Vagos Hadjimichael, dean of the School of Engineering, said he is very proud of Benjamin for his achievement over four years of demanding academic work. "I have followed Noah's development over the years and found him to be a consistently good learner and very affable. While he is starting work at Sikorsky, I am hoping that he will eventually go back to school for a graduate degree. He certainly has the capacity to contribute a great deal to his engineering discipline."

While at Fairfield, Benjamin was inducted into Tau Beta Phi, SOE's chapter of Tau Beta Pi, the prestigious engineering honor society. He was a student in the Honors Program and graduated summa cum laude.

In addition to the Bellarmine Medal, he received the John and Veronica Gleason Award, presented to the graduating senior with the highest academic average. He also was a cellist in Fairfield's orchestra.

The son of Norm and Pam Benjamin, he graduated from Simsbury High School in 2005. "During high school, I was a counselor at a summer camp for Boy Scouts and I enjoyed working on bicycles," Benjamin said. "I just liked seeing how they worked, their mechanics, parts. I also took a principles of engineering class in high school, so both got me thinking about studying engineering."



Noah Benjamin

Math and science awards received

The School of Engineering and Sikorsky Aircraft Corporation recently honored top high school students from all over Fairfield and New Haven counties at the 13th annual Excellence in Mathematics and Science Awards. The event recognized juniors from 35 area schools for their outstanding work and commitment to the study of science and mathematics.

Dean E. Vagos Hadjimichael and Susan Hitchcock, director of community relations for Sikorsky, presented 35 students with medals and certificates for their academic accomplishments at the Alumni House ceremony. The students were nominated by their respective principals and teachers.

Dr. Hadjimichael pointed to the thriving relationship between the School of Engineering and Sikorsky, one that has led to 89 graduates of the School employed by the company since 2001, as well as numerous current internship positions occupied by Fairfield engineering majors. Regarding the students who

were being honored, he said, "Together with our partners at Sikorsky, we are pleased to recognize the value of exceptional aptitude in science and mathematics, the two disciplines which are the foundation of our understanding of the workings of the Universe, and of the technology that shapes our daily lives on Earth."

This year's program included a talk by Dr. Ryan Munden, assistant professor of electrical engineering, who described the curriculum leading to a minor in nanotechnology in the School of Engineering.



Math and science awards ceremony

New grants

The School now has a fully equipped digital design laboratory with state-of-the-art technology, thanks in part to a \$177,400 grant from the Altera Corporation. The grant was the largest the School has ever received from the San Jose, Calif.-based company that is a pioneer in providing electronic design tools. It will support the School's Computer Engineering program, providing it with the latest software and hardware for teaching the Digital Design I and II and Advanced Digital Design courses.

"We now have a fully equipped digital design laboratory, with modern field programmable gate array software and hardware," said Dr. Douglas Lyon, professor of computer engineering and the principal investigator and project coordinator for the grant.

Dr. E. Vagos Hadjimichael, dean, said both undergraduates and graduate students will benefit. "These are very sophisticated tools that are not often found in a classroom. Our students will gain valuable skills from using them that will be of great value in the workplace."

The Digital Design courses instruct students about the basics and practical aspects of digital design, as well as digital logic, computer organization, and Field Programmable Gate Arrays (FPGAs). Students will get to use advanced technology and a wide range of design projects, as well as sophisticated digital system development. In the advanced course, they will learn about computer architecture, culminating in the ability to design and implement programmable finite-state machines.

"Basically, the grant enables students to design hardware using software-based tools," Dr. Lyon said.



Dr. Ryan Munden

In November 2009, Dr. Ryan Munden, assistant professor in the Electrical Engineering program, was awarded a \$20,000 grant from the Connecticut Space Grant College Consortium in support of his research on high efficiency nanowire photovoltaics. The scope of the project is to create a more efficient energy source through photovoltaic conversion of solar energy. There are many advantages in using

semiconductor nanowires in photovoltaic cells. In principle, the increased total surface area of the nanostructured wires, in contrast to the traditional planar devices, has the potential to increase the total photon capture and electron-hole pair generation and yield a greater efficiency in dc power production. The average solar energy conversion efficiency of traditional amorphous silicon or crystalline silicon solar cells is 12 to 15 percent. Financially speaking, photovoltaic solar energy conversion would be competitive with power production from burning coal or gas, if the efficiency could be raised to about 20 percent.

In September 2009, Dr. Hadjimichael was awarded a \$20,000 grant from the Earl W. and Hildagund A. Brinkman Foundation in support of equipment acquisition for a machine and tooling shop for the School of Engineering. This equipment will facilitate the work of students engaged in senior design projects.

Letter from the Dean *continued from page 1*

on a breathtaking range of challenging subjects, all at the frontier of applied knowledge. These publications are available for review at www.nap.edu. The reader will be intrigued by the breadth of interdisciplinary work and the integration of diverse areas of knowledge in 21st-century engineering undertakings. It is evident that in the present time and in the near future, engineering as a profession has an intellectually exciting road ahead, with its focus on social returns. Success depends on whether smart and talented young students, both men and

women, choose to enter the engineering profession or not. The need is great; the reward will be rich.

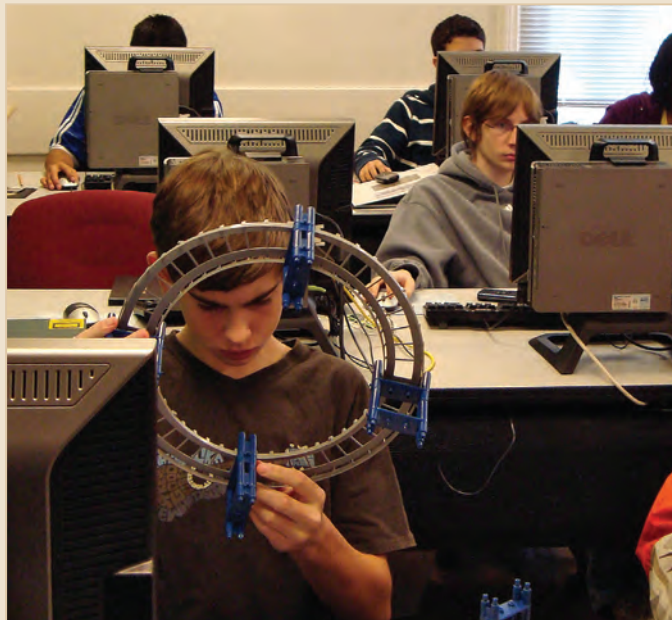
Sincerely,

A handwritten signature in black ink that reads "E. Hadjimichael".

E. Hadjimichael

Pre-engineering academy fuels love of science

The High School Engineering Academy (HSEA), an innovative Saturday morning program at the School, is working to create a pipeline of young science and engineering talent. It's an important mission considering that fewer American college students are choosing to study math, science, technology, and engineering in comparison with the needs of the nation. For the United States to continue to be competitive within the global economy, according to Dean E. Vagos Hadjimichael, it is vital that young people pursue careers in the sciences and engineering.



ulum will spark a love of these subjects among the participating students, especially among females and minority students, two segments of the population that are underrepresented in engineering.

“The students, as well as their parents, very much wanted to continue with this program,” said Dr. Hadjimichael. “In HSEA, the students are immersed in the culture of innovation, creativity, and problem solving. It is hoped that they will remain in this path later on in their life, as college students and as professionals.”

The HSEA program recently began its second year. It had gained overwhelming popularity among area high school students and their parents during the first year. This year, approximately 40 students from the five Catholic high schools of the Diocese of Bridgeport participate in HSEA. Members of the School of Engineering faculty teach in the Academy.

The curriculum is from the nationally recognized Project Lead the Way, a science/technology/engineering/mathematics (STEM) program. Organizers hope the pre-engineering curric-

The current HSEA students attend Notre Dame High School in Fairfield, St. Joseph High School in Trumbull, Kolbe-Cathedral in Bridgeport, Immaculate High School in Danbury, and Trinity Catholic in Stamford.

On Saturdays, they begin classes at 10:00 a.m. They break at noon for lunch, and continue their activities until 2:30 p.m. They use Fairfield's manufacturing, electrical, and computer engineering laboratories. The School of Engineering and the five high schools are contributing assets and money to fund HSEA this year, covering costs such as student transportation and meals.

32 freshmen attend SOE workshop by Enerida Ademi '13

On Saturday, Sept. 12, Dean Hadjimichael welcomed and addressed the 32 new freshman engineering students at a workshop entitled “Student Engagement for Academic Success: An Interactive Experience.” Dean Hadjimichael emphasized the importance of achieving one's own vision as a learner.

Held at Alumni House, the morning meeting informed students of their upcoming agenda and required courses for the next four years. The new students enjoyed a light breakfast with alumni and current students, discussing their future

classes and challenges.

“No other engineering school I know asks students to take liberal arts courses like we do,” said Dean Hadjimichael as he spoke about the students being well rounded after graduating from Fairfield.

As a non-engineering student in attendance, I came to the realization that Fairfield University offers great programs that are both challenging and helpful, and encourage one's best. All Fairfield students have the opportunity to leave the University with a great education.

Faculty Achievements

George Bauer, adjunct assistant professor, Mechanical Engineering, had an article, “Composite Plates Under Concentrated Load on One Edge and Uniform Load on the Opposite Edge,” accepted for publication in the journal *Advanced Materials and Structures*. He provided consulting to Sikorsky research and engineering in metals durability, fatigue, and fracture, as well as composites durability and damage modeling for Army programs.

Dr. Jack Beal, professor, Physics and Computer Engineering, has a joint appointment between physics and engineering. He spent his sabbatical leave in 2008-09 working on aspects of curriculum development for a potential biomedical engineering track.

Dr. Paul Botosani, adjunct professor, Mechanical Engineering, is directing the new program in automated manufacturing engineering. He was heavily involved in organizing the Conference on Automation in Manufacturing held at Fairfield in February 2009.

James Curry, adjunct associate professor, Management of Technology, was elected chairperson of the Simulation Technical Committee for the Society of Manufacturing Engineers.



Dr. Rao Dukkipati

Dr. Rao Dukkipati, professor and chair, Mechanical Engineering, published a peer-reviewed journal article and two peer-reviewed conference papers, with research collaborators, and four textbooks. The journal paper, “Design Modeling and Simulation of Mechatronic Systems,” was judged one of the most outstanding Society of Automotive Engineers (SAE) technical papers of 2008.

Dr. Shahrokh Etemad, adjunct professor, Mechanical Engineering, presented a reviewed technical paper at the ASME-IGTI (International Gas Turbine Institute) conference in June. The paper concerned low emissions performance of actual gas turbine engines using natural gas for power generation. He also presented a paper on a novel approach for low emission hydrogen combustion at the ASME-ICEPAG (International Colloquium on Environmentally Preferred Advanced Power Generation) conference in February.

Dr. E. Vagos Hadjimichael, professor and dean, received a \$25,000 grant from the Engineering Information Foundation to revamp and enrich the freshman class Fundamentals of Engineering and a \$25,000 grant from the Brinkman Fund to support senior design projects. He also organized the Conference on Automation in Manufacturing in February. He continues his research in photovoltaic solar energy conversion.



Dr. Douglas Lyon

Dr. Douglas Lyon, professor, Computer Engineering, has had six journal articles published recently. He was elected to serve as the chair of the Inventors Association of Connecticut in the next year.

Rino Nori, adjunct associate professor, Management of Technology, was one of two State of Connecticut Insurance and Financial Services (IFS) Industry Cluster instructors who conducted the 80-hour IFS Business Analyst Certification program for Connecticut.

Dr. Sherman Poultney, adjunct associate professor, Computer Engineering, gave a seminar, “Behind the Science and Technology Headlines,” at the Lifetime Learning Institute in Norwalk.



Dr. Jerry Sergent

Dr. Jerry Sergent, professor and chair, Electrical and Computer Engineering, integrated an \$89,000 3D printer for rapid prototyping into several SOE activities. He also attended a three-day nanotechnology short course at UMass in Lowell in May.

Kevin Violette, adjunct assistant professor, Management of Technology, was promoted to Senior Group Lead for Electronics Development at ASML, and was awarded two patents for inventions for a liquid flow proximity sensor for use in immersion lithography and a correction of off-axis translation of optical elements in the optical zoom assembly.

Salute to Rao Dukkipati

Dr. Rao Dukkipati, professor of mechanical engineering and chair of the Mechanical Engineering Department, left his position at Fairfield University in December 2009. He will move to Harrisburg, Penn., with his family.



Engineering students pose with their “human powered vehicle” with Dr. Rao Dukkipati, professor of engineering, at the wheel.

Dr. Dukkipati received his doctoral degree in mechanical engineering from Oklahoma State University in 1971. Earlier he had earned master’s degrees from the University of New Brunswick (1971) and Andhra University in India (1969). He joined the Fairfield faculty in the School of Engineering in 1999 as associate professor, and was promoted to professor and was awarded tenure in 2004. Prior to coming to Fairfield, he spent five years as a structures analyst at Pratt and Whitney Aircraft of Canada, and 18 years as senior research officer at the National Research Council of Canada doing work in ground vehicle system dynamics. He also spent three years as visiting professor at the University of Toledo. He is a registered professional engineer and fellow of the American Society of Mechanical Engineers and the Canadian Society for Mechanical Engineering. He also holds membership in the American Society of Engineering Education and the Society of Automotive Engineers.

Dr. Dukkipati has contributed enormously to his discipline. He has published more than 200 articles in national and international journals, conferences, and industrial technical reports in

the area of vehicle systems dynamics, mechanisms and machine design, optimization of mechanical systems, and structural analysis. He is also the author, or co-author, of 17 books, several of them written after he joined the SOE faculty.

At Fairfield, he taught both undergraduate and graduate courses. He was a major contributor to the creation of the master’s program in mechanical engineering in 2005. He has been a tireless worker and an excellent academic in all respects. His colleagues in Engineering have always appreciated his quiet and comforting manner, his boundless energy in managing the affairs of his department, and his ready willingness to assist in all things in the School. He deserves our gratitude, and that of his many students. He will be missed by all. We wish him the best as he begins the next phase of his life.

School welcomes new advisory board members

The School welcomed four new members to its Advisory Board, while offering thanks to three members who reached the limit of their service and left the board.

The new members are Paul M. Kelley, corporate vice president of Alinabal Corp; Jeffrey M. Post, general manager of Heim Bearings Co.; Robert Sobolewski, president of Ebm-Papst Inc.; and John Vazquez, vice president of corporate services and real estate at Met Life.

The School wishes to thank those members who are leaving for their dedicated service to Fairfield. They are: Michael Mulcahy, president, Trans Lux; Joseph Wall, senior vice president, Pitney Bowes; and Steven Culmone, vice president of operations, Ashcroft Inc.



Did you know?

Nearly \$91,000 in income from the SOE Endowment Fund provided tuition scholarships for undergraduate and graduate students in 2009-10. In the spirit of the University's strategic initiatives, SOE targeted meritorious students in need of aid.

All contributions to the endowment fund are reserved. Only the earnings are used for scholarships. New contributions to the SOE Endowment Fund principal, in the future, will help increase the number of scholarships to SOE students.

THE OWL

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Changing of the guard in MSMOT

Following 10 years of service as the director of the master's degree program in the Management of Technology, Dr. Jay Hoffman retired from his position in September 2009. He was succeeded by Dr. Harvey Hoffman – no kin to Jay – in this position.

Jay Hoffman had participated crucially in the establishment of the MS degree in Management of Technology in 1997-1998. This program was licensed and accredited by the Department of Higher Education in spring of 1998, and admitted its first class that September. Jay has been a constant overseer and a tireless director of the program and a caring and nurturing mentor of the MOT students. The School of Engineering owes him a debt of gratitude for his devotion to the School and for his constant and continuous service. Jay is a mechanical engineer by training with a Ph.D. degree from the University of Connecticut.

Harvey Hoffman's background includes both industry and academic experiences. He holds degrees in electrical engineering and a master's in management. He has a doctorate in higher education administration from Fordham University and is the author of a management textbook, *Organization Through the Eyes of a Project Manager*, and has published several academic and technical papers. Harvey has a long-time relationship with the MOT program having taught for many years the Project Management course and the Leadership in Technical Enterprise course, both required courses in the program.