



# The OWL

A PUBLICATION OF THE SCHOOL OF ENGINEERING

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## Welcome to our New Dean

**B**ruce W. Berdanier, Ph.D., currently professor and department head of Civil and Environmental Engineering at South Dakota State University (SDSU), has been selected to lead the Fairfield University School of Engineering. He fills a position so ably held for three years by dean Dr. Jack Beal, who is stepping down and returning to the faculty.

“We are all quite excited at the prospect of Dean Berdanier building on the solid foundation laid by Deans Beal and Hadjimichael and all of our engineering faculty over the past decades,” said Rev. Paul Fitzgerald, S.J., senior vice president for academic affairs. “Engineering education in a Jesuit context offers something quite unique: academic excellence in discipline-specific programs coupled with a broad-based liberal arts education. This leads to graduates who are not only professionally competent but who are also persons of integrity who look for opportunities to help those most in need. Dean Berdanier models all of these qualities, so he will be able to lead by example.”

Dr. Berdanier brings to Fairfield an impressive history of leadership, research, and management. He has been instrumental in furthering SDSU's efforts to increase its grant funded research at both the graduate and undergraduate levels, and he has recently led successful re-accreditation



efforts for the university's Civil Engineering program with the Accreditation Board for Engineering and Technology

(ABET). In addition to having spent the past 17 years in academia, Dr. Berdanier managed his own consulting engineering company from 1983 - 2007. The focus of his research and consulting relates to the distribution and interactions of various chemical compounds in studies of surface water quality and in municipal wastewater treatment. His list of publications and presentations on those subjects and others is extensive.

Keenly aware of the power of engineers to transform a society, Dr. Berdanier has a history of putting his talents to work in service to others. For 15 years, he has worked on engineering research and service projects in Haiti, and he was a Fulbright Research Scholar in Jordan. Over the past three years, Dr. Berdanier has been funded by the National Science Foundation to assist the Oglala Lakota College, a Native American Land Grant university in South Dakota, in developing their capacity to offer the first

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Fairfield  
UNIVERSITY

*School of Engineering*

## Senior Design Projects

### Infrared Bone Densitometer and Photoplethysmograph\*

Students/Major: **Eamonn Grant/EE, Dan Liashek/ME, Rafique Vahora/EE**

A prototype of a miniature device to measure bone density and blood flow to help NASA astronauts living in weightless conditions, and/or to help the aging prevent osteoporosis. Sponsored by the CT Space Grant. Winner of the Dean's Award for best senior design project.

Advisors: Dr. Ryan Munden, Dr. E. Hadjimichael

### Load Slot Bearing Lapping

Students/Major: **Italo A. Vanegas/ME, Julian Prada/ME, Marshall Johnson/MFE**

A device to perform a "rotary spherical lapping" operation that combines both a transverse and radial displacement of a uniquely designed CBN-Diamond bonded cutting tool to lap, at the exact radius of curvature, a ball bearing race.

Advisors: Dr. E. Hadjimichael, Gerald Cavallo

### SenseFit\*

Students/Major: **Elizabeth Cortez/ME, Nicole Stark/ME, Stephanie Cruz/SE**

A watch-like monitoring device using compact, wireless sensors to read and record heart rate, pulse ox, and muscle activity. Winner of the \$10,000 Dolan School Business Plan Competition.

Mentor: Dr. Ryan Munden. Advisor: Dr. Shahrokh Etemad

### Automated Video Metrology Device

Students/Major: **Michael Walsh/MFE, Brian Mulvey/ME, Joshua Fadrigo/ME**

An automated and extremely precise measuring instrument to verify the exact positioning of equipment used in laser cutting; ideal for the medical instrument industry.

Advisors: Dr. E. Hadjimichael, Rich Rosselli, Tom Hecht

### Heliostat: Sun Tracker Photovoltaic Solar Energy Converter

Students/Major: **John Soldano/ME, Francisco Robalino/EE, Daniel Maloney/EE**

A device with dual solar tracking ability to increase the efficiency of a solar system to the point where it can become a viable alternative to fuels.

Advisors: Dr. Douglas Lyon, Dr. E. Hadjimichael

### Rainwater Harvesting System Project\*

Students/Major: **Joseph Bocchino/ME, Andrew Jackowitz/ME, John Perry/ME**

A rainwater collection system, installed on the ground floor

of the Barone Campus Center, to harvest rainwater from the roof and patio area and used to water plantings. Awarded 2013 Campus Sustainability Grant.

Mentor: Dr. Shanon Reckinger. Advisor: Dr. Shahrokh Etemad

### Aerodynamic Nose Improvement of a Formula F Race Car

Students/Major: **Joseph Torok/ME, Davi Squizzato/ME**

An in-depth analysis of a nosecone for a Formula F racecar was performed using computational fluid dynamics, and theoretical improvements made to generate increased down force and reduce aerodynamic drag.

Mentor: Prof. Steve Roux. Advisor: Dr. Shahrokh Etemad



### Brain Buddy: Helmet Integrated Impact Detection System\*

Students/Major: **Ray Palama/EE, Anthony Scheer/ME, Serkan Erdas/ME**

Sports-related concussions or mild brain injuries are reported over 300,000 times annually.

This modular, compact and affordable sensor array measures the impact an athlete receives and communicates via Bluetooth technology to a parent or coach.

Instructor: Dr. Tim Talty. Advisor: Dr. Shahrokh Etemad

### Weight-Shift Control Light-Sport Aircraft

Students/Major: **Mike Chambers/EE, Kris McIntosh/ME, Adam O'Neil/ME**

Continuation of work on a previous senior design project of an aircraft to be powered by a four-stroke motorcycle engine. Design incorporates this engine to transfer power to a propeller drive. Awarded \$3000 from NASA Space Grant.

Mentor: Dr. Ryan Munden. Advisor: Dr. Shahrokh Etemad

### Quad Copter Development

Students/Major: **Ebuka Arinze/EE, Niccolai Arenas/ME, Choolwe Hachita/ME**

Development of a lightweight single-person copter that can be assembled and disassembled in minutes so it is portable for use

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## SOE Alumni Career Night

An Engineering Career Alumni Night, held last March to help undergraduates both network and prepare for positions in industry, was a resounding success, with 52 undergraduates and 13 alumni in attendance.

"The goal was to inform our current students, particularly the first and second year students, what they should be thinking about in preparation for job searching, networking, résumé building, internships, soft skills – the whole gamut of issues going beyond academics and Fairfield," noted Dr. Jack Beal, dean of the School of Engineering.

Spearheaded by Dr. Shahrokh Etemad with help from Stephanie Grejtak of the Career Planning Center, the evening began with a panel discussion, during which time alumni spoke about the relevance of internships to landing their jobs, their education at Fairfield, and the need for solid verbal and written communication skills. Following an informal reception that allowed time for questions and networking.

Panelists Jay Kohler ME'09 and Clare McManus ME'12 both confirmed the importance of getting an EIT (Engineer in Training) certificate during the end of senior year or immediately after. "And don't be afraid to move to another field,"

added McManus, currently employed by Spinware. "I was a mechanical engineer and am now doing biomedical work. Fairfield prepared me for that."

Jordan DiBona EE'12, presently employed by United Illuminating, told students that he greatly regretted not doing an internship during his undergraduate years. And Kevin Richard ME'12, now working at Electri-Cable Assemblies, admitted that he lost his shot at a good job because he didn't have a sample of his senior design project, the second item listed on his résumé. That resonated with Claudele Pierre '14. "I'm starting right now to prepare a portfolio of my class projects," she promised.

Panelists Lauren Loomer ME'09 (Sikorsky), Kim Sasso EE'12 (Roche), Kyle Prem CE'11 (NASDAQ) and Lavelle Summerville EE'11 (Steute) discussed their transition experience from classroom to workplace.

Following the panel discussion, John Lee, ECE (NASDAQ)'12, John Kamorowski ME'08 (DACO Instrument), Musruk Siddique ME'12 (RA Lalli Aerospace), Todd Lake ME'12 (Northeast Laser) and Jen Golia SE'10 participated at networking sessions interacting with smaller groups of students.

### Senior Design Projects *continued from page 2*

in military and police work, with a robotic arm to enable it to pick up/ drop items. Winner \$3000 from NASA Space Grant. Mentor: Dr. Ryan Munden. Advisor: Dr. Shahrokh Etemad

### Precision Bearing Clearance Measurement Device Development

Students/Major: **Alfredo Navarro/ME, Jackson Sarneski Hayes/ME**

Developed and fabricated a precision device to accurately measure the radial and axial bearing clearances in a single unit. Awarded \$5000 from RBC Heim Bearings.

Mentor and Advisor: Dr. Shahrokh Etemad

### Frame Stability Enhancement for Formula F Racecar

Students/Major: **David Keith/ME, Adam Powojski/ME**

This project analyzed the interface between the engine block and the steel frame of the car. Reducing the vibrational effects by adding simple structural steel tubing reduces lap times by a

few fractions of a second. (photo below) Mentor: Prof. Steve Roux. Advisor: Dr. Shahrokh Etemad

\* Example of a community engaged project



## Capstone Projects

### Biometric Signature Solution for a CT State Medical Facility\* Roy Mathew, Sagar Ghangrekar, Karishma Chand Thakur, Renu Bhandari/ MSMOT

Healthcare facilities have a need for HIPAA compliant electronic biometric signatures using an electronic fingerprint sensor. This project aims to implement an electronic biometric verification of clinicians who sign patient's progress notes, thus reducing costs and increasing efficiency.

### Parking Solutions\*

Michael Acosta-Madiedo, Sarah Davis, Jason Victor, Josh Frenzel/ MSMOT

A stand-alone optimized parking management solution for small institutions that interfaces to an existing computer system. It includes online vehicle registration/renewal capability and includes the identification of vehicle parking information.

### Emergency Operations Center (EOC) Design and Implementation\*

Bandar Almosa, Michael Graham-Cornell, Tarek Abouallaban, Wael Atarji/ MSMOT

Town and state officials were consulted in an effort to understand the town of Fairfield's EOC needs (primary or backup) and budgetary constraints. A baseline Emergency Operation Center on the Fairfield University campus was designed and implemented for use as backup should the town's primary center be flooded or otherwise damaged. (See pg. 10)

### Family ReEntry Program Management System\*

Bibhuti B. Dutta, Cynthia Erickson, Raghava Kannikanti, Leonard Charran/ MSSE

Returning to society after serving time in a Connecticut state prison can be a difficult task for those who lack a positive sup-

port system. The Family ReEntry agency helps offenders make important behavior changes. To solve the tedious manual data collection and reporting process in the organization, this capstone team developed a new web based database management system using Java and MySQL in Spring framework, which allows easy data collection, case management and reporting functionality.

### SafeReturn Application\*

Michael Marrero, Ebenezer Rodriguez Vida/ MSSE

The Fairfield Police Dept. (FPD) lacked an online system to record and retrieve information of individuals with special needs within the community, which forced officers on the road to be in passive roles during times of emergency. SafeReturn application allows the FPD to register these individuals, and record and maintain relevant data, including medical and caretaker contact information. The project was developed to ensure cross-platform and device compatibility using Twitter Bootstrap frontend framework and jQuery library providing user-friendly functionality.

### Virtual FTR Meeting Management

Deepa Patne, Sarah Altuwayjiri, Sushmita Diddu/ MSSE  
Formal Technical Review (FTR) is a key QA activity for systematic evaluation of software products by a team of qualified experts. The objectives of FTR are to uncover any errors in functions, logic or implementation, to verify if the software under review meets its requirements. However, FTR requires a lot of manual work. To resolve this problem, Online FTR Log Tool combined with BigBlueButton, a video conferencing tool, was implemented in IFrame technology.

\*Example of a Community Engaged project

## Faculty Highlights 2012-2013

**Cristian Craciun** – named chair-elect of ASEE (American Society for Engineering Education)- Northeast Region, an organization dedicated to furthering education in engineering and technology. As such, he will serve on the Executive Board and aid in arranging the program and details of the annual meeting. He will assume the chair of the organization in 2015.



Dr. Shahrokh Etemad

**Dr. Shahrokh Etemad** – published three peer-reviewed publications during 2012-2013, one of which included undergraduate student participation; organized presentation on "Business and Technical Aspects of Green Technology – Start-Up Story" as part of the University-wide Earth Day activities; developed a new five-year, BS/MS curriculum in Mechanical Engineering for the School of Engineering.

**Dr. Evangelos Hadjimichael** – appointed to the Planning Commission for Higher Education by the Connecticut State Legislature; continues to operate the rooftop photovoltaic project on campus (12.5 kW solar array); represents engineering on the University-wide Steering Committee on Applied Ethics.



Dr. Harvey Hoffman

**Dr. Harvey Hoffman** – worked with a team of MSMOT students to develop a Back-up Emergency Operations Center for the Town of Fairfield; served as examiner for the Malcolm Baldrige National Quality Award; served as program evaluator for Accreditation Board for Engineering and Technology (ABET); served as reviewer for the Accrediting Council of Independent Colleges (ACICS).

**Dr. Douglas Lyon** – served as president of the Inventors Association of Connecticut (IACT) to bring together students, faculty, and area entrepreneurs and inventors into an interactive and constructive dialogue; developed a new five-year BS/MS curriculum in Electrical and Computer for the School of Engineering; served as ABET Program Evaluator.

**Dr. Ryan Munden** – continued nano-materials R&D collaborations with the Brookhaven National Lab and the Lawrence

Berkeley National lab; hosted high school student groups on campus interested in careers in engineering; served as faculty advisor to the Engineering Student Society (ESS) - organizing field trips, workshops, outside speakers, activities for all engineering students.

**Dr. Shanon Reckinger** – served as visiting faculty member at Los Alamos National Laboratory during summer of 2012; presented three peer reviewed papers during the year describing her research in Computational Fluid Dynamics; selected to the NSF-ASAP Program – Advancing the Careers of Women in STEM at Predominantly Undergraduate Institutions.



Dr. Amalia Rusu

**Dr. Amalia Rusu** – promoted to associate professor of Software Engineering with tenure; co-authored three poster presentations with 16 of her undergraduate and graduate students; selected to the NSF-ASAP Program – Advancing the Careers of Women in STEM at Predominantly Undergraduate Institutions; received a second Google CS4HS grant.

**Dr. Bill Taylor** – completed a Fulbright Exchange Program at the Catholic University of Cameroon (CATUC); served as campus coordinator for the NASA – CT Space Grant College Consortium.



Dr. Bill Taylor

**Dr. Wook-Sung Yoo** – published five peer-reviewed publications on software development, two of which



Dr. Wook-Sung Yoo

included student participation; funded in the amount of \$9600 for the Graduate Research Internship Program (GRIP); developed a new concentration within Software Engineering focusing on Health Informatics.

### New Dean *continued from page 1*

two years of an undergraduate engineering program. More recently, he was instrumental in re-establishing an Engineers Without Borders chapter at SDSU, and he has travelled with students to Bolivia several times to implement a water treatment system. He plans to continue his focus on global outreach here at Fairfield, expanding opportunities for students to be involved in international research and service work.

"To be part of the School of Engineering that wants to address the grand challenges facing our society in the context of try-

ing to find better answers while serving the needs of the world is such a value-added proposition for everyone involved," Dr. Berdanier said.

Dr. Berdanier earned his bachelor's degree in civil engineering from The Ohio State University, his master's degree in environmental engineering from Purdue University, and his doctorate in environmental engineering and hydrogeology from The Ohio State University. He is a registered professional engineer and surveyor in Ohio and South Dakota.

## Fundamentals of Engineering Course Redesign

by Shanon Reckinger

Understanding the question, “What is an engineer?” was the driving force that shaped the newly redesigned EG31: *Fundamentals of Engineering* course at Fairfield, the first engineering course that all freshmen take.

Dr. Ryan Munden, assistant professor of electrical engineering, and Dr. Shanon Reckinger, assistant professor of mechanical engineering, led the course redesign. Throughout the process, they involved faculty from each of the departments in the School of Engineering. Before the redesign in Fall 2012, the course was a two-semester sequence. The course content was technically heavy, giving students a taste of many topics they would encounter in each of the engineering majors.

The redesign condensed the course into one semester and eliminated most of the engineering content and software training. The idea was that the students would learn that content best when they had full exposure later in the curriculum, in a course designed to fully engage the students in that material. The new focus of the *Fundamentals of Engineering* course was to motivate students to develop a passion for engineering. The final course goal was for the students to develop skills common to all engineering disciplines, including professionalism.

The course goals were achieved through a combination of unique, hands on, experiential learning based on engineering education research. In-class design projects included programming an arduino, building a prosthetic leg, and building a device to transfer radioactive golf balls. They worked in teams to “cross a river” with a limited amount of supplies and under a set of rules, and estimated the height of the engineering

building without the use of sophisticated measuring devices. Additionally, there were a variety of in-class activities with a focus on team building, listening skills, communication skills (both oral and written), and creativity and brainstorming. These included blind building, reading technical articles with clicker quizzes to follow, one-minute technical speeches, writing instructions for using electronics (students picked toaster ovens, hair dryers, iPods, and many more), and brainstorming uses for a wire coat hanger. The class was visited by engineers from Covidien, ASML, and Yale ROTC, and students were given the opportunity to take a field trip to Sikorsky.

Weekly work included an engineering problem set and a short technical writing piece submitted on the class blog. Problem sets focused on the engineering problem solving method and were based on content from their co-requisite physics course. Writing assignment topics ranged from “Explain how something works” to “Reflect on your speaking skills”.

The final project was an end-of-semester team design project. Students were challenged to design a device that could “Walk On Water” (WOW). The design goal was that they must be able to travel the length of the RecPlex swimming pool in a walking or running motion above water. The winning group used parts of a bicycle to create a paddle boat type device. Other creative devices included reconfiguring a treadmill, a human hamster wheel, using foot pumps, muffin tin shoes, huge foam shoes, the whale tail design, foot flipper propulsion, and ski type propulsion. View the Walk on Water video at [www.fairfield.edu/engineering](http://www.fairfield.edu/engineering)



All 54 freshman engineers took part in the Walk on Water project



And the winners are.... the intrepid team of Rob Joyce, Drew Mignosa (pictured), and Chris Rutigliano.

## Business Plan Competition



Rev. Paul Fitzgerald, S.J., senior vice president for academic affairs, left, and Dr. Donald Gibson, dean of the Charles F. Dolan School of Business, far right, present a \$10,000 check to Venture track winners Stephanie Cruz '13, Nicole Stark '13, and Elizabeth Cortez '13 of the School of Engineering. Also a part of their team is Dolan School student Bernardo Navarro '14.

Marry a great idea with a solid marketing plan, and you're likely to be on your way to a successful venture. The Dolan School of Business' Business Plan Competition is designed to encourage students to do just that. Open to students from across campus, the winning teams in each category – Venture and Social Enterprise – were comprised of both engineering and business students who have been working together all year. They took home a lot more than a pat on the back.

The winning team in the Venture category was the “SenseFit” team, including three engineering students who play for Fairfield University varsity and club teams. “We wanted to combine the skills we've learned in engineering with our passion for sports,” said Elizabeth Cortez, '13, who is captain of the women's rugby team and a mechanical engineering major. She was part of a group that designed the wristwatch-type device that uses compact, wireless sensors to read and record heart rate, pulse ox, and muscle activity using conventional Bluetooth technology and an easy to use smartphone application. Estimated to cost about \$250, it's targeted for everyone from NCAA athletes in training to baby boomers trying to stay fit to active senior citizens. The team also included Nicole Stark, '13, a mechanical engineering major; Stephanie Cruz, '13, a software engineering major; and Bernardo Navarro, '14, an accounting and economics major in the Dolan School.

As a member of the volleyball team, Cruz knows a lot about how teamwork and countless hours of practice can pay off.

“I believe that even if we did not win a monetary award, this was a meaningful experience for me that will help me in my future career,” said Cruz, who added she was grateful to mentors Mark Willkehr, an entrepreneur, and Associate Professor Shahrokh Etemad, chairman of mechanical engineering.

The engineering students developed the monitor as part of the School of Engineering's Senior Design course, which challenges students to put all their engineering knowledge to work. Dr. Etemad said the idea for targeting their market to baby boomers and senior citizens was seeded during a presentation made by marketing faculty member John Neal, while Drs. Ryan Munden and Tim Talty lent their technical expertise. “This team consists of three athletes with a win-win mentality, and a bright business major,” pointed out Dr. Etemad.

Electrical engineering major Darren Mondezie, '14, and business student Alex Boothe, '16, teamed up to create the inCognito Climate Controlled Hat after Boothe's fight with cancer (photo below). “When you are in treatment, your body temperature can really fluctuate,” said Boothe, a freshman majoring in marketing and management, who is now cancer-free. “These hats are personal heating and cooling systems that can keep you warm or cool – whatever you want.”

The two students met at the competition's Saturday Startup Day earlier in the academic year, which brought together curious self-starters. Fusing their business and technical acumen, the ‘InCognito’ team continues to work on a prototype of the \$27 hat. They envision it as a big draw for cancer hospital gift shops, cancer organizations and even Fairfield University, complete with a Stag logo on it. James Dugan '85 served as their mentor.

“This is one milestone in our journey to fighting pediatric cancer, and people can expect to see us more in the near future,” said Mondezie.

Social track winners Alex Booth '16 of the School of Business, mentor James Dugan '85, and engineering student Darren Mondezie '14



## Commencement 2013



The Reverend Michael J. Garanzini, S.J., president of Loyola University Chicago and a national figure in Jesuit higher education, gave the Commencement address, asking graduates, "...Who will help create a just and right society, if not for you?"

Rain forced the celebrants inside for the afternoon graduate ceremony, but the mood was joyous as Fairfield awarded 396 master's degrees, 44 of which were in engineering. The University also conferred 19 certificates of advanced study and three doctor of nursing practice degrees.

The two honorary degree recipients were Patrick W. Kelley '76, P'12, M.D., DrPH, of Silver Spring, Maryland, director of the Boards of Global Health and African Science Academy Development at the U.S. National Academies, and Sister Patricia Farrell, OSF, LCSW, LMHP, a Sister of St. Francis of the Holy Family, Dubuque, Iowa, and the immediate past president of the Leadership Conference of Women Religious.

University President Jeffrey P. von Arx, S.J., told the graduates that they will always be part of the Fairfield community.

"We, the faculty and administration, are filled with pride in your accomplishments," he said. "During your time of study here, you shaped us all with your enthusiasm, with your passion for learning, with your good humor, and through the close relationships that you have forged here, which I am sure will be with you for the rest of your life."

Fairfield University awarded diplomas to 861 undergraduate students at the 63rd Commencement exercises on May 19, as 5,000 family members and friends watched with pride on Bellarmine Lawn. The graduates earned degrees from the College of Arts & Sciences, Charles F. Dolan School of Business, the School of Engineering, and the School of Nursing. Thirty-one of those graduated with a B.S. in engineering, and one with an associate degree of engineering. As has been the trend, the largest numbers were in mechanical engineering. The vast majority of engineering graduates have jobs or are going on to graduate school.

## Dr. Hadjimichael elected to CASE

The Connecticut Academy of Science and Engineering (CASE) has elected Evangelos Hadjimichael, Ph.D., founding dean of Fairfield University's School of Engineering, to membership in its select organization. Dr. Hadjimichael is now professor of physics and engineering.

The Connecticut Academy is patterned after the National Academy of Sciences and the National Academy of Engineering in Washington, D.C. The major objective of the Connecticut Academy is to provide information and advice to the government, industry, and people of Connecticut, and to encourage the young in science, engineering, and technology.

"I am very pleased to have been elected to membership in CASE; I see this election not just as an honor, but primarily as an opportunity for me to serve further the interests of the State of Connecticut," Dr. Hadjimichael said.

Dr. Hadjimichael was instrumental in merging the Bridgeport Engineering Institute with Fairfield University, thus establishing the School of Engineering. During his 15-year tenure as dean, he established academic alliances that continue to provide a seamless pathway for community college students into the School of Engineering, and he introduced numerous programmatic and curricular innovations, including an Assessment and Continuous Quality Improvement Process (AQUIP), which proved to be invaluable as part of the re-accreditation process in 1999 and 2005. Further, he shepherded the establishment of a statewide nanotechnology minor linking the University with research institutions.



Dr. Hadjimichael

"Dr. Hadjimichael has been an invaluable member of the Fairfield University community for over 45 years," noted Jack Beal, Ph.D., dean of Fairfield's School of Engineering. "He has been an outstanding faculty member and mentor to our students. He has been an able and collegial administrator at the University. But most of all, he has been a valuable colleague and friend to all of us here at Fairfield and across Connecticut. He is richly deserving of this honor."

After earning his doctorate in physics from the University of California at Berkeley, Dr. Hadjimichael did a three-year post-doctoral fellowship at Yale, and was subsequently appointed to the faculty at Fairfield. His research in nuclear and elementary particle physics was supported by NSF grants, without interruption, from 1972 to 1996. He served on the Advisory Council on Accreditation, Board of Higher Education, Connecticut, for six years, and was vice-chair and chair of the Council. In 2007-2008, he headed a 15-person inter-institutional group that developed an undergraduate curriculum in nanotechnology for statewide use. He was recently appointed to the Planning Commission for Higher Education, State of Connecticut.



(Opposite page, top) Stephanie Cruz (SE), Elizabeth Cortez (ME), Michael Chambers (EE), Joseph Bocchino (ME), all Class of '13, try to stay dry as they ready to process into Commencement exercises.

(Opposite page, bottom left) Robert Czerwony, Karishma Chand Thakur, Renu Bhandari and Daniel Beck take their places as the Graduate Commencement ceremonies begin.

(Opposite page, bottom right) Graduate engineers Wael Atarji, Sarah Altwayjiri, and Bandar Almosa

(This page, left): Graduating seniors share a lighter moment.

## Fairfield University to Serve as Back-Up Site for Town of Fairfield's Emergency Operations Center

When Hurricane Sandy floodwaters came within a quarter of a mile of the Town of Fairfield's Police Headquarters on Reef Road, officials realized that they better find a back-up location for their Emergency Operations Center (EOC) if it ever became inaccessible.

Enter a group of Fairfield University School of Engineering graduate students and their plan to make the University's Barone Campus Center (BCC) an alternative EOC site - command central for coordinating emergency services during a crisis. The plan was put to the test recently during a mock drill involving

emergency personnel from the Town of Fairfield, the Fairfield University Department of Public Safety, students, and staff.

"Fairfield University has got a number of things going for it in setting up a temporary Emergency Operations Center," said student Wael Atarji who worked on the project with classmates Tarek Abouallaban, Bandar

Almosa, and Michael Graham-Cornell. "We knew, for example, we have more than adequate Information Technology resources, and campus is a very important [200 feet] above sea level."

Enrolled in the Management of Technology Program, they put together a comprehensive plan to relocate the emergency center to BCC conference rooms 200, 204 and 206 as part of a Capstone course, an assignment that challenges graduating students to use all their engineering knowledge. Among their objectives were finding a backup location that is normally used for other purposes, but that could be re-purposed as an EOC with minimal advance notice. Most importantly, the location had to be equipped, prepared and maintained at a low cost.

Deputy Fire Chief Arthur J. Reid, the Town assistant emergency manager, said the initial drill went smoothly. "This is a great boost to us to have this plan," Reid noted. "Fairfield University can meet our significant technology and communication needs, and there is also a campus [CO-GEN plant that produces its own power] if the electricity goes out."

In case of a crisis such as a HAZMAT situation on Interstate 95 or terrorism downtown, the campus is in an ideal location, Reid emphasized. Plus, it's on high ground in case of a hurricane, an asset in case police headquarters need to be evacuated.



As part of a Capstone course, a group of School of Engineering graduate students developed a plan to make the Barone Campus Center an alternative emergency operations center for the Town of Fairfield. [L-R] Wael Atarji, Deputy Fire Chief Arthur J. Reid, Tarek Abouallaban, Michael Graham-Cornell, Bandar Almosa and Dr. Harvey Hoffman.

students from Fairfield Beach, so they share a history of meeting challenges crises present.

The project was set in motion after Dr. Harvey Hoffman, director of the Management of Technology Program, approached engineering student Kathleen Griffin, assistant to First Selectman Michael Tetreau, about Capstone students doing a task for the Town. "It's in concert with the Fairfield University Jesuit mission of service and is a win-win for everyone," said Dr. Hoffman who served as the students' mentor alongside Associate Professor Mark Ramsey.

Fairfield University Public Safety Director Todd Pelazza said the University and town partnering on the EOC drill was the latest endeavor in a longtime collaboration. "This just seemed like a natural fit," said Pelazza.

Frank Ficko, associate director of public safety at Fairfield, pointed out the Town and University worked closely during Hurricanes Sandy and Irene to evacuate

## Google Computer Program for H.S. Teachers

With help from a grant from Google, Fairfield University's School of Engineering will present a workshop from June 26-28 for area high school teachers looking for innovative, out-of-the-box ways to use Google Apps, computer science, and gaming tools in the classroom. This is the second year that the workshop, spearheaded by Dr. Amalia Rusu, associate professor of Software Engineering, has been offered through Fairfield University.

Twenty computer science teachers from public, private and parochial high schools in Fairfield and New Haven Counties will participate in this 'Google Computer Science for High School' program at Fairfield. Stipends of \$300 are paid to par-

ticipants upon completion of the full program, the overall goal of which is to provide ways for educators to teach high school students how to solve problems creatively by introducing gaming concepts and collaborative Google tools. The teachers will use the School of Engineering's labs.

Dr. Rusu was grateful for the \$12,000 funding from Google, noting that the focus of this year's training will be two-fold. "First, to continue the implementation of computer science and engineering concepts through STEM [science, technology, engineering and math] education, and second, to create connections and extensions for high school teachers who have already been introduced to STEM curricula and teaching models."

## Modernization of Mechanical Engineering Laboratories

Understanding the theory of heat transfer, fluid dynamics or vibrations is useful knowledge for any engineer, but that knowledge won't become a skill until the student can put theory into practice. This year, several pieces of equipment helped mechanical engineering students do just that. All were funded in part with a generous grant from The Brinkman Family Foundation.

- The Zwick Roell Instron tests compression and material tensile (right). This unit was upgraded to improved control, accuracy and loading mechanism. Students will run experiments in support of sophomore Material Science and Strength of Materials courses.



- In order to understand heat transfer and the parameters, such as flow velocity, affecting that energy transfer, new Armfield forced convection heat transfer equipment was purchased and will be used in the Thermal and Fluid Transfer lab in support of senior level Heat Transfer course.

- A Pelton wheel turbine will allow for more fluid dynamics experiments part of Energy Transfer Lab.

- A brand new TecQuipment vibration experiment machine (right) will allow for 12 basic to advanced level experiments. Students will use this equipment as part of the Energy Transfer lab in support of senior level Engineering System Dynamics course.



"The curriculum was synchronized so students learn theory in the classroom and within the same semester practice experiments to reinforce that theory," noted Dr. Shahrokh Etemad, chair of the Mechanical Engineering Department. In parallel, additional stations were created to accommodate the growing number of mechanical engineering students.

Dr. Etemad noted that the modernization of mechanical engineering lab began several years ago. The next target is to upgrade units such as the refrigeration unit, torsional stress/strain, fatigue tester as well as adding additional stations. These will strengthen the mechanics and thermal specialization areas of the mechanical engineering program. The School welcomes donations in support of enhancing the labs further.

Tickets for the upcoming art season at The Quick Center are available now! Visit [www.fairfield.edu/newseason](http://www.fairfield.edu/newseason) or call 1-877-arts-396.

The Owl is published once a year by Fairfield University for alumni, students, benefactors, and friends of the School of Engineering, as well as selected corporations.

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## Letter from the Dean

All of us in the School of Engineering agree that the 2012 – 2013 year was one of our best to date. Last fall, we welcomed 55 new first-year students plus five transfer students from area community colleges – up from 44 the year before. We had seven visiting students from Brazil and Tanzania, bringing our total undergraduate population to 205 and our graduate total to 125. The quality of our incoming undergraduate students continues to increase as evidenced by steadily increasing SAT scores and students with AP credits.

With external gifts and University support, the School was able to purchase several new teaching lab systems ranging from an upgrade of the Zwick-Instron instrument to a state-of-the-art system to be used as the basic test instrument for Materials Science and Strength of Materials labs. Additional electronics instrumentation is available, and in the machine shop, a new and more rugged band saw is now available for metal fabrication projects and a CNC milling machine is on order.

Student teams completed 18 senior/capstone projects – the largest number in recent history (see page 2). Two of these

were supported by the NASA CT Space Grant Consortium and several were supported by corporate sponsors. One was the overall winner of the Dolan School of Business' Business Plan Competition (see page 7). One student will continue developing his senior project ideas as a thesis at the M.S. level.

Of special note, the School of Engineering will welcome a new dean – Dr. Bruce Berdanier (see page 1). He will bring to us fresh perspectives on engineering education for our students, and we all look forward to his leadership for our programs.

While I have enjoyed my three years as dean, I am eagerly looking forward to returning to the teaching faculty. I am pleased at the accomplishments that we have been able to make and I look forward to new and exciting activities in the coming years. My sincere thanks to all who have supported engineering and have contributed to making these accomplishments a reality.

Jack Beal, Ph.D.  
Dean and professor