

MESSAGE FROM THE DEAN



I am delighted to welcome you to this issue of the College of Engineering Newsletter as the new

dean. In the short nine months since I was given the opportunity to lead this vibrant college I have had the privilege of getting to know and working with dynamic faculty, conscientious staff, and students who have a passion for engineering. Thanks to the support I have received from every corner of the College, I have had wonderful time while learning on the job and getting adjusted to the new environment.

Many exciting things have happened in 2007 – 2008 such as the Eco-Car, the funding of the Florida Center of Advanced Aero Propul-

sion (FCAAP) in partnership with FSU, UCF, and FU, the Engineering Scholars Program at Embry-Riddle (ESPER), and the success of our students in the formula hybrid car, Baja car and the AUVSI autonomous vehicle competitions. I am looking forward to more such successes in 2008 – 2009.

I hope you enjoy reading about the recent activities and accomplishments of the faculty and students at the College of Engineering.

Maj Mirmirani, Dean

ENGINEERING SCHOLARS PROGRAM CONTINUES INTO SECOND YEAR

Embry-Riddle and the College of Engineering is once again offering a free seven-week summer program for selected Volusia County high school students. The Engineering Scholars Program at Embry-Riddle or ESPER, is designed to help students focus on science, engineering, mathematics and physics coursework while in high school. The 2008 summer session is the second year that the ESPER program is being offered to local high school students.

The goal of ESPER is to encourage students to choose a math or science-based program as their college course of study, and ultimately choose a career in those fields. Upon successful completion of the program (which runs from June 25 to August 11, 2008), students will receive six semester hours at Embry-Riddle and one

elective credit at their home high school. Students who successfully complete the courses will be eligible for annual scholarships if they choose to attend ERAU.

Twenty-five Volusia County, Fla., high school juniors were selected to participate in ESPER over the past two years. Students receive the equivalent of a \$7,125 scholarship from Embry-Riddle Aeronautical University for the seven-week program. The scholarships cover the entire cost of tuition and fees. A joint agreement with Volusia County Schools allows the cost of books for the three introductory engineering courses to be paid by the school district. The courses taken by the students are designed to motivate and encourage the students' decision towards a career in engineering, science, mathematics, or physics.

Over the course of the program students will be mentored and advised by faculty and students, enjoy course-based field trips, have access to laboratories, and interact with college students pursuing related career fields. During the first year of the program 94% of the students said their understanding of engineering **STRONGLY IMPROVED** because of the summer ESPER program and 71% of the students indicated they will pursue **ENGINEERING** or are **STILL EXPLORING** the degree options in the STEM fields.



EMBRY-RIDDLE HONORED AS TOP 100 EMPLOYER FOR WORKING FAMILIES FOR THIRD STRAIGHT YEAR

For the third year in a row, Embry-Riddle Aeronautical University has been named one of Central Florida's Top 100 Companies for Working Families.

The Top 100 employers are chosen for this honor on the basis of their family-related benefits, work environment, communication network, and training opportunities. The Top 100 list is composed of 50 companies that have 249 employees or fewer, and 50 companies that have 250 employees or more. Embry-Riddle has 2,000 full-time employees worldwide, with 1,255 of them in Central Florida.

Embry-Riddle's newest benefit was a Monday-through-Thursday summer workweek. "We instituted the four-day workweek on a trial basis, and it's proved very popu-

lar," said Irene McReynolds, Embry-Riddle's vice president of human resources. "Employees enjoy having a three-day weekend to be with their families, and students use the extra day off to study. We'll consider whether to make the summer four-day workweek a permanent benefit after we analyze the feedback thoroughly." Under another new benefit, employees working an alternate full-time schedule of 30-39 hours per week are now eligible for personal-leave accrual and for tuition waivers for the employee, spouse or domestic partner, and dependent children.

Employees and their family members have access to a world-class education at Embry-Riddle, through 100 percent waivers of tuition for credit courses and 25 per-

cent waivers of flight lab fees. More than 30 undergraduate and graduate degree programs in aviation/aerospace, engineering, business, and related fields are available. As a bonus, Embry-Riddle's participation in a national tuition exchange program allows dependent children of employees to choose between 500 U.S. colleges and universities to attend tuition-free.

Embry-Riddle employees get plenty of time to spend with their families, starting with 11 paid holidays each year, plus the business days between Christmas and New Year's Day. Workers also accrue personal leave, which is used for vacation, illness, and so on, and increases with years of service. New employees earn between 12 and 18 days of personal leave in their first year of full-time employment.

RESEARCH NEWS

A number of our Engineering faculty, including Drs. Nakhla, Gangadharan, Golubev, and Gupta took part in the 46th AIAA Aerospace Sciences Meeting (ASM) that for the last time was held in Reno in January of 2008.

In particular, Dr. Golubev has presented a paper "Investigations of Nonlinear Unsteady Aerodynamic and Aeroacoustic Responses of

Oscillating Airfoils in Non-Uniform Flow" on his research that was supported the Air Force Research Laboratory and involved collaboration with the Central Aerohydrodynamic Institute (TsAGI) in Russia.

The next three AIAA ASM meetings will take place in Orlando (Florida). For the next meeting in January of 2009, AIAA has selected Dr. Golubev from our Aerospace Engi-

neering department as a Chair of the Aeroacoustics Program.

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ALUMNI CORNER: MOBILITY, QUALITY CONTROL, AND ENERGY MANAGEMENT

By Sieffried Hotter, Germany



25 years ago I started studying engineering at ERAU in world famous Daytona Beach without having a scholarship and without being enrolled in U.S. Army ROTC. One thing I was truly endowed with was an innate interest in mobility.

At the age of 17, while attending high school, I had started building my first car, a Dune Buggy, with salvaged VW-Beetle junkyard parts. The Beetle's automotive technology was uncomplicated and I must have been somewhat mechanically inclined to go ahead with an action that is normally effected with commercial kit car assemblies. I've decided to build my first automobile. I was really impressing my schoolmates, my teachers, and even my girlfriend's father started to like me. It was a step in the direction of car making that seems to have determined great parts of my life. It took me nine months of weekend's work to acquire the

parts or subassemblies, to complete the mechanical assembly and electric installation works, spray painting the glass fiber body, getting the mandatory street worthiness certification and the vehicle's registration with insurance. The car had a tight canopy, a safety glass windshield with working wipers, and a roll-over bar. The cockpit took me a lot of time to make up. Amazingly, after nine months of weekend's work I became the first car owner in my high school class but I had no driver's license because by that time I had not come of age yet.

But by the age of 19 I had realized that my lightweight Dune Buggy needed an alternate impulsion system, one that could impel it uphill independently of wheel traction. Naturally it came to me that the airboat's propeller impulsion principle was the most appropriate technology available, but the car was not big enough to accommodate one. I quickly realized that only a small gas turbine could be integrated as an auxilliary propulsion system and that is how I started getting interested in aircraft propulsion technology.

I seriously got obsessed by the idea of building a small gas turbine for my Dune Buggy, but my technical background and manufacturing skills were not enough to even properly understand the intricacy of such technology. I could only dream about it while attending freshman engineering courses at a university, and thinking of getting into flying, a very appealing form of mobility. After a few semesters I realized that I needed a technologically more appropriate environment for my line of interest. I moved to Daytona Beach, and registered at Embry-

Riddle Aeronautical University to major in Aeronautical Engineering.

At ERAU I experienced a very powerful educational tailwind. It offered the possibility of fast academic advancing, continuously assessed by an intensive quality control of the learning process taking place in students' minds. Everything taught in class was actually tested. With over 30 semesters of college education in different countries, majors, and educational systems, I'm actually qualified to maintain this point about ERAU's high quality of education. ERAU's education is very pragmatic and offers diligent students a fair chance to earn good grades by working hard during the semester. I wish I had taken more time for my degree at ERAU, but some changes in my financial situation forced me to obtain my degree as fast as possible

In July of 2007 I graduated as a Mechanical Engineer from the Munich University of Applied Sciences. I studied while being a full-time employee and it took me 13 semesters to pull it through. During this time I worked for 31/2 years in special tool engineering for the manufacturing and repairing of gas turbine components as well as facilities for gas turbine testing at MTU Aero Engines. To me, this



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was working in techno paradise. Also, for years I have been working as a street vehicle component development engineer for BMW and this has verified my innate interest in mobility.

Just like in gas turbine manufacturing, cars need to be developed to meet the highest possible safety and quality standards in order to avoid human and financial losses. My engineering work in vibration engineering and structural dynamics in the field of the steering column and the steering wheel brings me in close contact with vehicle components that have a direct impact on driver's safety upon accidental collisions. We have all seen what airbags can do to save human lives sitting behind the steering wheel, but very few are aware of the possible lethal effects of an airbag that detonates accidentally because quality controls were lacking during its manufacturing processes. Crash tests show how relevant the energy-absorbing function of both the steering column and the airbag is during impact, but most people cannot imagine how much systematic quality control it takes to produce millions of airbags with a functional warranty of 100%.

The other topic I want to bring to the reader's attention is energy management, because it is directly related to vehicular mobility. Why energy management instead of just energy? Because there has always been plenty of energy available on earth, but it was mostly a matter of managing its conversion into useful forms of mobility or the ability of performing useful mechanical work, as well as storing and transporting it for timely implementation. Pure energy there is plentiful, but it is mostly not available where we need it or when we need it and most probably not in the forms we can use it or store it. We do not need to look far behind in history to understand how strategi-

cally important the availability of appropriate forms of energy has always been to mankind and how much more important it will be in the future. About the serious effects that available energy has on vehicle-based mobility I want to say that

there sure are acceptable alternative forms of energy to those fossil fuels gained from crude oil. But we seriously need to work on a global mobility concept that can be properly marketed if we want to live on without serious mobility interruptions and travelling comfort losses once oil-derived fuels turn so expensive that we cannot afford to buy them anymore. One thing I can sure foretell in view of our past global energetic developments: We'll try to implement something that fits into the present energetic infrastructure in absolutely the same way we did when slowly switching from coal combustion and steam expansion to the energetically more efficient petrol combustion and gas expansion. Maybe those huge deposits of methane hydrate laying on the ocean bottom could be energetically managed to satisfy our needs while partly fitting into our energetic infrastructure and the existing combustion engine technology. That would actually mean engineering and building appropriate mining ships and research submarines to keep us properly mobile.

As far as I'm concerned by this old but primordial energy issue, I'll be topping my Mechanical Engineering degree with a specialization in Energy Technologies during the winter semester, starting in October. I must stay ahead in matters of the basic survival strategies of mo-

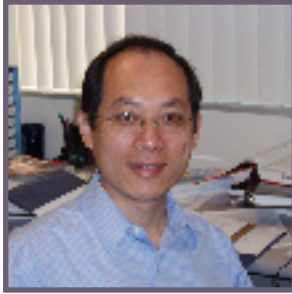


bility, quality control, and energy management.

I hope my article was worth reading and of some interest to the Engineering News readers. I will be glad to discuss and exchange ideas and criticism on these issues.

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IEEE TRIP TO HUNTSVILLE



Dr. Jianhua Liu

This semester eight IEEE student members of ERAU and Dr. Liu drove

to Huntsville, AL to participate in IEEE SoutheastCon 2008. The students participated in a few competitions, including the eye-catching Student Hardware Competition.

Our students did pretty good in the Student Hardware Competition. 41 teams participated in the regular play of the competition; and ERAU team ranked #4. Top 8 teams made the play off; and Embry-Riddle students ranked #5. Considering our short history with this competition

and the strong rivals our students have done a great job!

Besides being the advisor of the IEEE students, Dr. Liu also chaired a section of presentation in the conference. He presented two papers in this section, and both of them were very well received---the audience showed much interests.

LEAN AEROSPACE INITIATIVE

AE Professor Chuck Eastlake was invited by MIT to speak at the Lean Aerospace Initiative (LAI) Lean Educator Conference in Boston on April 25, 2008. The topic was "Incorporating Lean Engineering into a Capstone Design Course". It was part of a 4-person panel entitled "Strategies for Integrating Lean into the Curriculum," moderated by Dr. Earll Murman, retired chair of the MIT Aerospace Engineering Department who has twice visited the Daytona Beach campus

to participate in Lean Engineering curricular activities. Related strategies used by Dr. Magdy Attia in his propulsion design classes were included in the discussion.

Embry-Riddle was invited to join the LAI Educational Network shortly after its creation in 2003. As a result, an extensive library of background information and course materials is available at no cost to ERAU through the MIT LAI website, and we are permitted to

use it in any of our courses.



Dr. Chuck Eastlake

WOMEN'S BAJA OFF TO TENNESSEE



The Women's Baja Team went to Tennessee Tech to compete in the Baja SAE East Competition. This is their third year participating. ERAU Women's team was competing

against a field of 84 predominantly male teams.

The team would like to thank: Dr Mirmirani, Dr Grant, Dr Helfrick, Dr Eslami, BOT Member Dave Robinson, SGA, the Annual Fund and Dr Detore-Nakamura for their generous support of this team. A special thank you to Dr White

as without his initial vision this team would not be there.

The Lady Eagles have spent the last year designing, building, redesign-

ing, and testing, and redesigning a car of their own design.

They had freshmen, sophmores, juniors, and seniors participating.

Check out the Baja website at <http://students.sae.org/competitions/bajasae/> for additional information.

Lisa Davids
Heidi Steinhauer
Co-Advisors

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UPSILON PI EPSILON INDUCTS NEW MEMBERS



The ERAU Chapter of Upsilon Pi Epsilon held its Spring 2008 Induction Ceremony to honor students selected for Society membership on Wednesday, April 2, 2008. The ceremony was conducted by Sean Pfeifer, Chapter President, and assisted by Ken Evensen

and Il Wan Lee, UPE members. Six students majoring in Software Engineering, Computer Engineering and Computer Science and a faculty member of the Department of Computer and Software Engineering were admitted to membership in Upsilon Pi Epsilon. The

ceremony was attended by COE faculty, UPE members and family and friends of the new initiates.

Upsilon Pi Epsilon is an international honorary society whose membership consists of outstanding undergraduate and graduate students in the computing disciplines. The organization now consists of more than 180 chapters in colleges and universities in North America and overseas.

The Iota Chapter at Embry-Riddle Aeronautical University was chartered on October 10, 1997. Prof. Nick Brixius is the COE faculty advisor for the chapter.

More information about Upsilon Pi Epsilon can be found on the Web at <http://www.acm.org/upe/>.

GRADUATE STUDENT RESEARCH PROGRAM

NASA Graduate Student Research program is offered to both Doctorate and Master's Degree students, and allows them to get involved in research with different research centers. Yadira Chatman is the only Master student in the nation doing the program in collaboration with Kennedy Space Center.



CIVIL ENGINEERING SCHOLARSHIP AWARDS

Two of Embry-Riddle Civil Engineering students, Jeffrey Rapolti, senior, and Anna Sobolewska, freshman, received \$500 scholarship awards from the American Society of Civil Engineers.



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