



MECHANICAL ENGINEERING NEWSLETTER

Volume 2, Issue 2—April 2007

INSIDE THIS ISSUE:

<i>Past Events</i>	2
<i>ASME News</i>	2
<i>Research Update</i>	2
<i>EPT Trip Report</i>	2
<i>New Interns</i>	3
<i>Funnies</i>	3
<i>ME Workshop</i>	3
<i>Minor in Polymer Engineering and Science</i>	4

Mechanical Engineering Program

The Petroleum Institute
P.O. Box 2533
Abu Dhabi
United Arab Emirates

Phone: +971 2.508.5362
Fax: +971.2.508.5200
Internet: www.pi.ac.ae/me

DIRECTOR'S MESSAGE

Dear Students, Alumni, and Colleagues:

This is the third ME newsletter and I would like to make it an effective instrument of communication among students, alumni, and staff/faculty members of the Mechanical Engineering Program. In the future we will write about not only what is happening in the program, in terms of academic topics and social activities, but also voices from alumni and others as well.

By the time, this newsletter is published, only one more month of this spring semester will be left and we will have another 30 plus seniors graduating from the ME program soon. These are the seniors who will have successfully completed our vigorous curriculum and will join last year's graduates as alumni of the PI Mechanical Engineering Program. We are proud of their accomplishment. I have heard that last year's graduates are doing well at the various ADNOC companies where they are being employed. Those will be the future leaders of industry in the UAE.

There are some new and exciting developments in the ME program. New polymer courses are being offered for students who would like to take "Polymer Engineering" as his minor within the ME program. More information on this subject is available on page 4 of this newsletter. We are also getting two CNC machines (milling and lathe) in our machine shop. Through these machines, students will learn how to operate a CAD/CAM system. These are just a few of the new and exciting things happening within the ME program.

Since the establishment of the PI, we have accomplished a great deal in a relatively short period of time, thanks to many different contributors. We may be becoming "good", but we are still a long way from "great". As Jim Collins writes in his book "Good to Great", "good is the enemy of great". We should not be satisfied with being just good. We are still a young organization and need to address many areas in order to develop.

Let's work together and accomplish our mission and our goals, turning this program from "good to great!".

If you have any suggestions, please stop by my office and tell me about them. My door is always open to any one of you.

Isoroku Kubo — Acting Program Director

STUDENT ACADEMIC ACHIEVEMENTS AWARDS

The ME students whose names are listed below were awarded the Outstanding Achievement Certificate for their exceptional academic performance for the fall semester of the academic year 2006-2007:

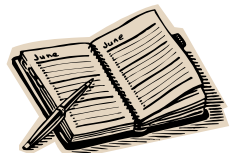
Mr. Abdulla El Mahmoud (Senior), Mr. Bilal Hajo (Senior), Mr. Mohamed Al Hammadi (Junior), Mr. Hussain Al Hashimi (Junior), Mr. Hesham Ismail (Junior), Mr. Yousef Al Tartoor (Sophomore), Mr. Bakeer Bakeer (Sophomore), Mr. Abdulla Al Zaabi (Sophomore), Mr. Odai Al Nazer (Sophomore), Mr. Adel Khalaf (Sophomore), Mr. Saoud Al Ameri (Sophomore), Mr. Mahmoud Adi (Sophomore)

These students will receive their certificates in May 2007 during the ME social event, details of which are given in the upcoming events. These awards will be given each semester. The minimum eligibility requirements are: 15 credit hours of coursework and a term GPA greater than 3.5.

UPCOMING EVENTS

- An important date to note is Tuesday May 15, for which a get-together for all ME students, faculty and staff is planned, starting at 5:30 pm. The event, which will be held on the PI campus, will feature a barbeque, games, lots of fun and surprises. So, join us and have fun with all the ME team.
- A Senior design exhibition will be held on the last week of May. Students in the senior design course MEEG415 will participate in this event to showcase their designs. An achievement award will be given to the student design team that has excelled in this discipline.
- The Fifth Mediterranean Combustion Symposium will take place on September 2007 in Monastir, Tunisia. For further information please visit <http://www.ichmt.org/upcoming-meetings/MCS-07/announce.html>
- One ME student, based on his leadership skills and academic record, will be chosen to participate in a field trip to Japan sponsored by JODCO. The trip will take place this summer.

Please check the announcement boards regularly and ME website for future updates.



PAST EVENTS



March 29, 2007, the Mechanical Engineering program hosted H.E. Mr. Takuma Hatano, Japanese Ambassador to the United Arab Emirates.

During his visit Mr. Hatano toured the Petroleum Institute facilities and met with a number of faculty, staff, and students.

He was impressed by the quality of the ME labs and the rapid growth the ME department has experienced over the past three years.



February 25, 2007, Professor Johannes Georg Bednorz, 1987 Nobel Laureate for Physics, presented a lecture entitled "The Excitement of Science - Dreaming Allowed", as part of the Leaders in Engineering Seminar Series.



December 4, 2006, Mr. Tony Meggs, Group Vice President, Technology, British Petroleum (BP) presented a lecture entitled "Future Energy Trends and technology", as part of the Leaders in Engineering Seminar Series.



December 12, 2006, Professor Nariman Farvardin, Professor and Dean, James Clark School of Engineering, U. of Maryland, presented a lecture entitled "Pathways in Engineering Education, Research, and Entrepreneurship", as part of the Leaders in Engineering Seminar Series.



November 26, 2006, Professor Wolfgang Herrmann, President of the Technical University of Munich presented a lecture entitled "Strategies for Excellence in High Tech Research", as part of the Leaders in Engineering Seminar Series. The lecture was followed by a tour of the mechanical engineering program laboratory facilities.

ASME NEWS

The PI ASME student chapter currently has 53 registered members. Membership access, benefits and information can be found at <http://www.asme.org>

The student chapter will be helping organize the forthcoming ME Social Event on Tuesday, May 15, 2007. The outgoing ASME student committee officers will be recognized for their contributions during the 2006/2007 academic year.

A new ASME student committee is to be formed for the 2007/2008 academic year. Those members interested in becoming committee members should contact Dr. Mark Caulfield-Browne (PI Student Faculty Advisor, mbrowne@pi.ac.ae) before May 20, 2007.



RESEARCH UPDATE

- Two new exchange BSc students from Germany and one MSc student from Tunisia are conducting research work under the guidance of ME faculty.
- ME faculty members are involved in research work with the University of Maryland as part of PI-UMD EERC contract.
- A workshop conducted by ADNOC operating companies took place at the PI on February 19, 2007 to identify research priorities for the first phase of the PI research building.

EPT TRIP REPORT

By Dr. Abdennour C. Seibi

As part of its educational mission, l'Ecole Polytechnique de Tunis (EPT) in Tunisia, embarked on a program that invites Tunisian academics from around the world to participate in running particular modules in their fields of expertise. This program attracted several faculty members from the United States of America, Canada, Europe, and recently from the Middle East, who are recognized internationally for their research work. The aim of my visit was twofold:

- Teach a short course on Nonlinear Finite Element Modeling.
- Discuss in detail a the research topic with an MSc student at EPT, who will be conducting the research work at the Petroleum Institute starting late April 2007.

The short course covered the finite element formulation of geometric and material nonlinearities as well as procedures on finite element modeling. The course ran for 16 hours in one week and was divided into two sessions. The first session focused on presenting the finite element application and formulation of nonlinear problems, and the second session was devoted to solving real-life problems using a finite element package. Furthermore, I had the opportunity to meet the rector, and professors of EPT, which has provided a strong foundation to future academic collaborations between the PI and EPT.

A student from EPT is currently completing his MSc thesis at the PI. Possibilities for enhancing the ties between the PI and EPT are currently being explored.

Overall, the visit was very useful academically.

NEW INTERNS



Lassaad Mhamdi, Research Assistant Intern

Mr. Mhamdi is working on his Master thesis at the PI. In September 2006, he started graduate work at Tunisia Polytechnic School in Computational Mechanics. This highly selective graduate program was launched in September 2003 in collaboration with the department of Engineering Science and Mechanics of Virginia Tech, with funding from the US State department.

Mr. Mhamdi will receive his MSc in December 2007. He is currently working with Dr. Seibi on the tubular expansion project.



Thomas Polzer, Research Assistant Intern

Mr. Polzer is completing his second practical semester at the PI. He is studying mechanical engineering at the University of Applied Sciences Mannheim, Germany, and will graduate next year.

Under the guidance of Dr. Karkoub he is currently working on the Drilling-shaft-twisting-machine project.



Marco Gartner, Research Assistant Intern

Mr. Gartner is currently completing his second practical semester at the PI. He is studying mechanical engineering at the University of Applied Sciences Mannheim, Germany. He is in his 7th Semester and is going to finish his studies next year. He is a stipendiary of the German National Scholarship Society since 2006. Before his studies he completed an apprenticeship as mechanic at DaimlerChrysler AG.

At the PI, he is currently involved in research on drilling machine simulation under the guidance of Dr. Karkoub.

FUNNIES

- To the optimist, the glass is half full.
- To the pessimist, the glass is half empty.
- To the engineer, the glass is twice as big as it needs to be.

ME WORKSHOP

By Alan Hardy and Allan Partridge

If the project parts can be made at the PI Machine Shop facility then they should. This was the premise upon which the Machine Shop was set up in January 2005.

The Machine Shop has six centre lathes for making round parts and two vertical milling machines for making flat parts. A recent addition has been a fabrication and welding area where sheet metal parts can be marked out, folded, and welded. A number of machining/welding courses have been run, where students had hands on experience of using the equipment. It is hoped that in August 2007 this area will be further enhanced by the acquisition of a computer numerical controlled lathe and a computer numerical controlled milling machine. Both machines can be programmed direct or at a remote location using computer aided manufacturing software.

We are not a big facility as machine shops go, but then again, from the acorn, you know what can grow!



MINOR IN POLYMER ENGINEERING AND SCIENCE

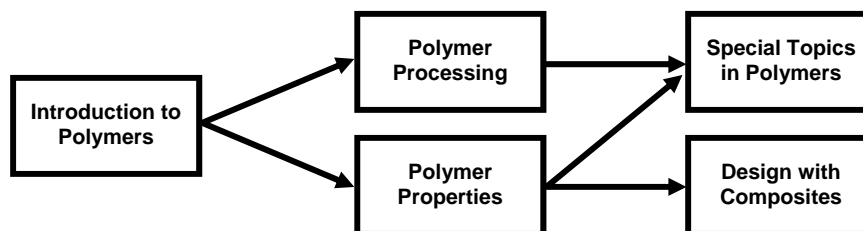
By Dr. Tahar Nabil Tarfa

The last few years have seen a tremendous growth in the business activities related to the polymer materials in the UAE. These materials offer new perspectives in the use of the natural resources of the country on one hand, and can be advantageous in solving some of the limitations inherent to metallic components e.g. the corrosion, on the other hand.

Therefore, and in line with the directives of H.E. Yousef Omais bin Yousef and as of Fall 2007 semester, the Mechanical Engineering Program jointly with the Chemical Engineering Program will be launching a new Polymer Engineering track.

A task force including faculty from both departments was formed to design, develop and implement a set of courses covering both the fundamentals and the practical aspects of polymer engineering, in parallel with the existing curricula.

The diagram below shows a typical path, starting from junior year or later, a Mechanical Engineering student may take in order to graduate in Mechanical Engineering with minor in Polymer Engineering. The student will have to complete a minimum of 18 credits from this track, or less if this is combined with some other courses from the Major program such as materials science, mechanics of materials, etc.



The Mechanical Engineering students are strongly encouraged to consider this option as this may open up new career opportunities for them. For further information, please contact Dr. Tahar Nabil Tarfa, Mechanical Engineering Department, office 3004.

A team of professors from Leoben University-Austria with a strong background in the Polymer Engineering and Science, lead by Dr. Prof. Reinhold Lang was instrumental in developing and setting up this Polymer Engineering track. A short description of their background is given below.

I would like to use this opportunity on the behalf of the Mechanical Engineering Department to deeply thank them all for their tremendous efforts and for the smooth collaboration with the PI.



Prof. Reinhold W. Lang

Ph.D. Lehigh University, USA, 1984

- Full Professor and Head of the Institute of Materials Science and Testing of Plastics, University of Leoben, Austria.
- Scientific Director of the Polymer Competence Center Leoben GmbH (PCCL), Leoben, Austria, since 2002.

- Industrial Scientist and Qualification Manager for advanced composites at BASF AG, Ludwigshafen (Germany), 1984 to 1991.

Research Areas

- Structural and functional properties of polymers and composites
- Polymeric materials for solar energy applications



Prof. Gerald Pinter

Ph.D. University of Leoben, Austria, 1999

- University Assistant at the Institute of Materials Science and Testing of Plastics, University of Leoben, Austria, since 1995.
- Senior Scientist at the Polymer Competence Center Leoben GmbH (PCCL), Leoben, Austria, since 2002.

Research Areas

- Deformation and fracture behavior of polyolefins and composites
- Fracture mechanics characterization of polymers under monotonic and cyclic loads
- Macro- and micro-mechanical characterization of polymer-nanocomposites



Prof. Gernot Wallner

Ph.D. University of Leoben, Austria, 2000

- University Assistant at the Institute of Materials Science and Testing of Plastics, University of Leoben, Austria, since 1995.
- Senior Scientist at the Polymer Competence Center Leoben GmbH (PCCL), Leoben, Austria, since 2002.

Research Areas

- Physical analysis and characterization of polymers (spectroscopy, thermoanalysis, microscopy)
- Functional polymeric materials (optical and thermal properties)
- Weathering and ageing of polymers
- Polymeric materials for solar energy engineering



Dipl.Ing. Thomas Lucyshin

M.Sc. University of Leoben, Austria, 2001

- University Assistant at the Institute of Plastics Processing, University of Leoben, Austria, since 1995.
- Project Leader at the Polymer Competence Center Leoben GmbH (PCCL), Leoben, Austria, since 2006.

Research Areas

- Simulation of injection molding process
- Influence of material data on injection molding simulation
- Measurement of pVT-data at high cooling rates
- Expert system for injection molds